Kardinya District Centre
Activity Centre Plan

May 2020 | 18-668

element.
the art and science of place

We acknowledge the custodians of this land, the Whadjuk Noongar and their Elders past, present and emerging. We wish to acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region.

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Issue	Date	Status	Prepared by	Approved by
3	19.03.20	DRAFT	Callum Thatcher	David Read
4	13.05.20	FINAL	Callum Thatcher	David Read
5	27.05.20	FINAL V.02	Callum Thatcher	David Read
6	19.06.20	FINAL V.03	Callum Thatcher	David Read

Endorsement Page

This Activity Centre plan is prepared under the provisions of the City of Melville Local Planning Scheme No.6.

IT IS CERTIFIED THAT THIS Activity Centre PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

_____

Date

Signed for and on behalf of the Western Australian Planning Commission:

_____

an officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:

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Witness

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Date

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Date of Expiry

Table of Amendments

Amendment No.	Summary of Amendment	Amendment Type	Date Approved by WAPC

Contents

1. Executive Summary

The Kardinya Activity Centre Plan has been prepared in accordance with the requirements of the *Planning and Development (Local Planning Schemes) Regulations 2015* and State Planning Policy 4.2: Activity Centres for Perth and Peel (SPP 4.2), to guide future activity and development in the area which can be generally described as Kardinya Park Shopping Centre and surrounds. The primary aim of the Activity Centre Plan (ACP) is to outline basic development controls and guide the necessary Scheme Amendment to the City of Melville Local Planning Scheme No. 6 (LPS6). The ACP in implementation should result in a vibrant centre which is economically viable and sustainable with supporting residential density to capitalise on existing and future public transport infrastructure.

The ACP is intended to guide development over a 10-year timeframe and provide a number of recommendations to assist with implementation. The Activity Centre hierarchy in SPP 4.2 defines an Activity Centre as community focal points with commercial, retail, high density housing, entertainment, tourism, civic / community, higher education and medical services.

The ACP includes two parts in accordance with the SPP 4.2. Part one contains the statutory provisions in relation to the implementation of the Activity Centre structure plan compromising of land use and built form provisions while part two provides explanatory information.

This ACP is intended to help facilitate the evolution of the Kardinya Park Shopping Centre into a mixed-use Activity Centre that builds upon the existing (and any proposed) public transport infrastructure along South Street, its associated retail areas and residential frame. It is intended that increased residential densities within the surrounding area to the Kardinya Park Shopping centre will further contribute to the walkable catchment of this centre and increase the patronage and viability of public transport infrastructure, thereby reducing car reliance and enhancing the vitality of local businesses.

Up to approximately 26,701m^2 of retail floorspace area is proposed for the Kardinya District Centre which includes both Lot 17 and Lot 31. The proposed density increases that are proposed will help support the viability of the Centre and capitalise of the increased service amenity. Accordingly, approximately 1,850 additional dwellings can potentially be accommodated throughout the Centre through associated residential density changes to support the viability of the Activity Centre.

1.1 Density Targets and Retail Growth

The plan estimates a total of 200 dwellings will be developed within the District Centre over the next 30 years by 2050. The ACP as a whole, has aimed to align the broader residential catchment to achieve a minimum of 30 dwellings per gross hectare by 2050, to align with targets for District Centres in the WAPC's SPP 4.2. This outcome would deliver on the expectations of Perth and Peel @3.5 million and the City's Local Planning Strategy to concentrate development in strategic Activity Centres and along transit corridors.

The ACP provides for growth of Kardinya Park Shopping Centre to approximately 22,244m^2 shop/retail floorspace, accommodating supermarkets, a discount department store and associated speciality stores and mini majors within the Core. The remaining 3,000m^2 of retail floor space will remain for the Centre Frame lot to expand accordingly aligned with the Retail Sustainability Assessment (RSA) and existing on-site retail floor space.

An overview of the key characteristics of the ACP is provided in Table 1.

Table 1 – Activity Centre Plan Overview

Item	Data
Activity Centre Plan Area	58ha (gross urban hectares)
Total Estimated Lot Yield	32 dwellings per gross hectare
Estimated number of dwellings by 2050	Approximately: 629 Proposed Total: 1,875 (based on a 50% density uptake) Net additional: 1,246
Estimated population by 2050	3,375 (based on 1.8 people per dwelling)
Number of high schools	Not applicable
Number of primary schools	Not applicable
Estimated commercial floorspace	**Estimated total non-residential floorspace** 2020: 3,000m2 (6,692m^2 proposed within DA) 2030: 15,692m^2 **Estimated total shop/retail floorspace:** 2020: 15,053m^2 (8,913m^2 proposed within DA) 2030: 26,701m^2
Estimated area and percentage of public open space	**Public Open Space** 36,000m^2 (Alan Edwards Park) 11,646m^2 (Laurie Withers Reserve) 1,581m^2 (Jack O'Keefe Reserve) 2,768.2m^2 + 36,120m^2 (Morris Buzacott Reserve) 4,877m^2 (Harry Patterson Park) Total: 92,992.2m^2 (9.2ha) - 15.8%

Figure 1. ACP Boundary

Part 1: Statutory Section

LEGEND

- ACP Boundary
- Passive Frontage
- Landscape Frontage
- High Speed Frontage
- Active Frontage
- Existing Pedestrian connection
- Proposed Pedestrian Connection (1.5m)
- Key Pedestrian Link
- Future Easement In-gross
- Vehicle Access
- Strategic Signage
- Key Public Space
- Landmark

Figure 2. ACP Map

LEGEND

- ACP Boundary
- 15 - 20 storey above natural ground level
- 5 storey above natural ground level
- 4 storey above natural ground level
- 3 storey above natural ground level
- 2 storey above natural ground level
- 2 storey existing

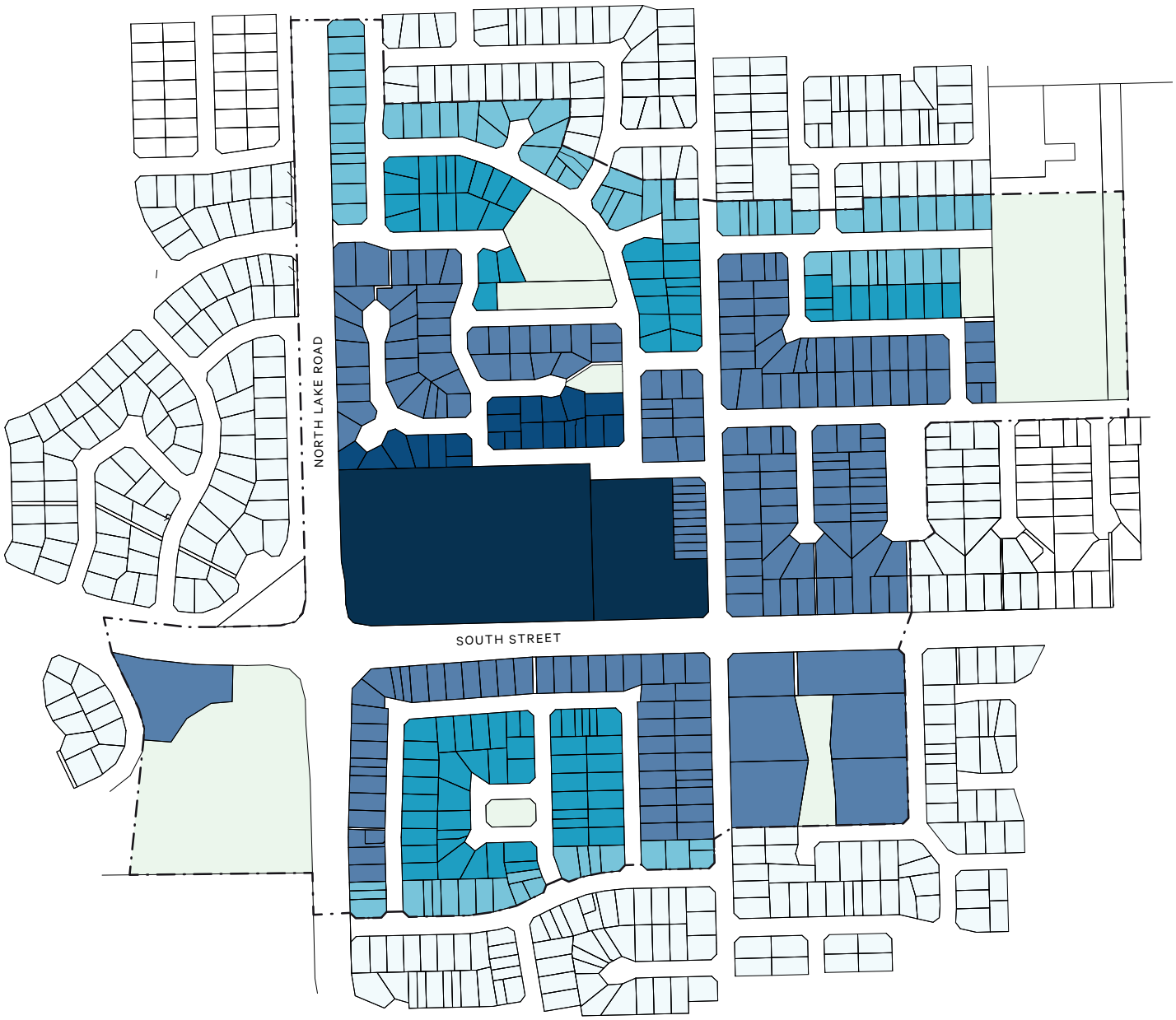


Figure 3. ACP Building Height

LEGEND

- ACP Boundary
- Existing Pedestrian connection
- Proposed Pedestrian Connection (1.5m)
- Key Pedestrian Link
- Future Easement In-gross
- Vehicle Access
- Land Take Required

Figure 4. ACP Movement Map

2. Implementation

2.1 Activity Centre Plan

This ACP applies to the Kardinya District Activity Centre and encompasses land generally within a 400m catchment around the Kardinya Park Shopping Centre, in Kardinya, Western Australia. The ACP applies to all areas within the boundary identified on the ACP map (Figure 1).

2.2 Operation

This ACP comes into effect on the day it is approved by the Western Australian Planning Commission (WAPC), the date of which is outlined on the endorsement page. As per the deemed provisions, from the date of endorsement this ACP is to have effect for a period of 10 years, unless otherwise determined by the WAPC. Where there is an inconsistency with the City of Melville LPS6, then LPS6 shall prevail to the extent of any inconsistency, until it is acknowledged and intended for LPS6 to be amended to reflect the densities shown on this ACP prior to them being implemented.

Unless otherwise specified, the words and expressions used in this ACP shall have the respective meanings given to them in the LPS6.

Nothing in this ACP is to be interpreted as limiting clause 43 of the deemed provisions that outlines that a decision-maker for an application for development approval or subdivision approval in an area that is covered by an ACP is to have due regard to, but is not bound by, the ACP when determining the application.

2.3 Activity Centre Vision and Objectives

The vision for the Kardinya centre is as follows:

> *'The Kardinya centre will be a vibrant and exciting focal point of entertainment, hospitality and retail services to create a contemporary, localised centre to accommodate all user's needs in the one location, supported by a higher density residential precinct.'*

Development in the ACP area shall align with the following objectives:

- Promote high quality, larger scale development within the Activity Centre Core Precinct within the specified built form controls.
- To deliver a functional shopping centre which provides for local employment, local needs and the wider visiting population.
- To promote the development of a diverse mix of housing types, lot sizes and densities.
- To promote active and alternative forms of transport while providing a convenient centre.
- To promote activation of the Centre both in the day and evening through an inviting dining precinct and community meeting spaces.

2.4 Subdivision and Development Requirements

2.4.1 Precincts and objectives

The ACP area has been divided into three precincts in this plan (refer to Figure 5), generally characterised by varying intensity of development and mix of uses. The precincts are as follows:

- Centre Core
- Centre Frame
- Residential

Table 2 – Precinct Summary

Precinct	Proposed LPS 6 Zones	Density Coding	Character Statement
Centre Core	Centre C2	R-AC0	To provide the Core of the Activity Centre. A mixture of retail and commercial uses are envisaged in combination with high density residential development.
Centre Frame	Centre C2	R-AC0	To provide a combination of high density residential, and speciality commercial tenancies both non-retail based and retail area. Residential and compatible commercial uses at ground floor are appropriate (as provided for under LPS 6).
Residential	Residential	R160, R100, R160/R80, R60, R40	To provide for medium to high density residential close to the Activity Centre and South Street transit corridor.

2.4.2 Land use permissibility

a) Land use permissibility within the ACP area shall be in accordance with LPS6.

b) The following additional uses are permitted for the following land within the 'Residential Precinct':

Table 3 – Additional Land Use Table

No.	Description of Land	Additional Use	Conditions
6	L108 (88) Gilbertson Road, Kardinya	Service Station Convenience Store	
9	L157/Strata L1 (25) South Street, cnr Gilbertson Road, Kardinya	Office Consulting Rooms Medical Centre	
19	L148 (No.68), L1 (No.70), L150 (No.72), L1 (No.74), L22 (No.75), L153 (No.78), L154 (No.80), L155 (No.82), Lot 156 (No.84) Gilbertson Road, Kardinya	Office Consulting Rooms Medical Centre	

Land use permissibility's in the Centre C2 zone shall be in accordance with the zoning table for the Centre C3 zone.

c) The land use definition 'Advertisement' is to be inserted into Division 2 – Land use terms used in LPS6, in accordance with the following definition:

"Means any word, letter, model, sign placard, board, notice, device or representation, whether illuminated or not, in the nature of, and employed wholly or partly. for the purposes of, advertisement, announcement or direction, and includes any hoarding or similar structure used, or adapted for use, for the display of advertisements. The term includes any airborne device anchored to any land or building and any vehicle or trailer or other similar object placed or located so as to serve the purpose of advertising."

2.4.3 Additional Uses

Table 4 of LPS6 prescribes a list of additional uses for specific lots within the City of Melville's scheme area. There are two existing lots within this ACP area that have pre-existing additional uses. Lot 108 which is currently occupied by a service station, and Lot 157 an existing residential dwelling. In this regard, the ACP and pending Scheme Amendment has no intention on removing these lots from Table 4 of LPS6, rather seek to modify the prescribed land uses. Lot 108 shall remain as a service station, however the pending Scheme Amendment will seek to include convenience store into the additional use table, as currently convenience store is an X use within a residential zone. Lot 157 will also be modified to include consulting rooms and medical centre, as additional land uses to diversify the opportunities on this site. The Scheme Amendment will also seek to remove 'single storey residential character of the premises being retained' given this will impede future redevelopment opportunities and will not be consistent with the intent of the ACP.

Given the site is not of local or State heritage significance and therefore is considered unnecessary to be retained. In addition to the amendments proposed to the existing Additional Use Table, a number of lots fronting Gilbertson Road will be included. The intent behind this is to encourage ground floor commercial land uses to provide a cohesive commercial interface with the Frame of Kardinya District Centre. Office, consulting rooms and medical centre are all land uses that are appropriate to integrate with the residential nature of the area, whilst offer essential services to the wider community.

2.4.4 Advertisement Definition

In accordance with the deemed provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015* the definition of advertisement will be inserted into the pending Scheme Amendment to be included within division 2 – land use terms within LPS6.

2.4.5 Restrictive Covenants

Within the ACP catchment, there are existing historic restrictive covenants that have the potential to impede future development uptake in accordance with the objectives and intent of the ACP. To facilitate the extinguishment of restrictive covenants within the ACP, a Scheme Amendment is required. This process is set out within Western Australian Planning Commission (WAPC) Planning Bulletin 91/2017, paragraph 6.2. To ensure the ACP is able to be implemented to the full extent intended, a subsequent Scheme Amendment will be prepared concurrently to lift pre-existing covenants that would restrict the orderly and proper implementation of the ACP.

2.4.6 Development Controls

Centre Core

The objectives of the Centre Core Precinct are:

- Concentrate non-residential development within the Centre Core;
- Enable the growth of the retail component to allow for increased local employment and for a high quality retail experience while maintaining the Centre's District Centre role;
- Improve the maturity of the Centre, by promoting a range of commercial, retail and entertainment choices to meet the needs of the locality;
- Encourage uses such as entertainment and hospitality that are likely to extend the period of activity within the Centre; and
- Promote greater housing density with managed interface to surrounding residential areas and transport corridors.

The following development requirements apply within the Centre Core precinct:

Table 4: Centre Core Development Controls

Element	Controls
Residential Development	All residential development proposed within the Centre Core shall be in accordance with the requirements of State Planning Policy 7.3, Residential Design Codes Volume 2 – Apartments.
Non-Residential Development	All non-residential development proposed within the Centre Core shall have regard to the requirements of the City of Melville's local planning policy 2.1 (Non-Residential Development).
Plot Ratio	No plot ratio applies. Development shall be controlled by setbacks and building height.
Frontages	• A frontage type has been allocated for street frontages on the Figure 2. • Frontage types have been identified to ensure activity and built form responds to create the desired street interface for the relevant street context. • Development shall generally be in accordance with the relevant frontage requirements under this part. • The frontage types, in order from highest to lowest activation are: – Active – Passive – Landscaped – High Speed
Active Frontages	This frontage type is proposed for areas in the Centre Core precinct as shown on Figure 2. This frontage will cater for those areas that are projected to have frequent pedestrian movement, requiring street level activation, visual engagement and main street principles to be incorporated into the built form. Development that occurs within these locations shall be in accordance with the following: **Setbacks** • Nil setback to buildings are required. Building setbacks may be considered where active uses are proposed (such as alfresco dining) where a setback can facilitate greater interaction with the street. **Building Mass and Form** • Building facades to maximise engagement to the street by: • Appropriate façade glazing treatments; • Entrances and windows oriented towards the public realm; • Avoiding expanses of blank walls; and • Awnings being provided along the building frontage with sufficient width to provide pedestrian shelter.
Passive Frontages	This frontage type is proposed for areas which are highly visible but do not necessarily accommodate highly active functions as shown in Figure 2. High quality design features are to be provided in façade elements, in accordance with the following: **Setbacks** • Nil setback to buildings required. Building setbacks may be considered where active uses are proposed (such as alfresco dining) where a greater setback can facilitate greater interaction to the street. **Building Mass and Form** • Building facades to maximise articulation and architectural features of visual interest. • Awnings to be provided along the building frontage where practical to provide pedestrian shelter
Landscaped Frontages	This frontage type is intended to buffer and or screen the impacts of servicing back of house environments as well as improve interfaces that are otherwise restricted in providing a visually appealing environment, as shown in Figure 2. Landscaping in these environments shall be provided extensively for these frontages with a combination plantings and landscaping screens (both hard and soft) to buffer the buildings interface from abutting street frontages.
High Speed Frontages	This frontage type reflects built form that this experienced from passing vehicles where pedestrian movement is predominantly low, as indicated in Figure 2. **Setbacks** • Nil setbacks to buildings permitted to North Lake Road and South Street. • Where vehicle parking is proposed, landscaping and/or screening is to be incorporated to enhance the appearance of facades and minimise the impact of parking. **Building Mass and Form** • Building facades to incorporate variations in depth, height, colour, texture and/or materials as well as openings where practical to create interest and visual surveillance.
Landmark Locations	Landmark location sites are identified by Figure 2. Built form at landmark locations shall be treated with additional architectural emphasis such as distinctive roof forms and detailing, complemented by a contrast in materiality. **Setbacks** • A nil setback is permitted for landmark development sites. **Building Height** • To emphasis these corner sites, built form is permitted with additional height of 5 storeys (maximum 20 storeys).
Key Public Spaces	On-site open space shall be provided for public and/or communal use in areas noted for 'key public spaces' on Figure 2.
Retail Floorspace Area	The total net lettable area of all existing and future shop retail development within the core area shall not exceed 22,244m^2 (existing: 13,776m^2). For the purposes of the ACP, NLA shop/retail floorspace is defined as per the Scheme, but also excludes: • Loading and storage areas • Any children's play area and/or equipment; and • All areas (including any alfresco seating areas) associated with eating and entertainment uses. Prior to the consideration of proposals for development which exceeds the shop/retail floorspace area identified above the responsible authority will require the preparation of a Retail Sustainability Assessment (or similar), in accordance with SPP 4.2.

Element	Controls
Non-Retail Floorspace Area	The total net lettable area of all future non-retail development within the core area must not exceed 8,692m^2 (proposed: 6,692m^2).
Vehicle Parking and Access	• Car parking for all residential development shall be provided in accordance with the requirements of the Residential Design Codes of Western Australia. • Car Parking for all non-residential development shall generally be provided in accordance with the City of Melville's applicable Local Planning Policy, unless supported by a suitable parking needs study and implemented in accordance with an approved parking management plan. • Vehicle access points shall generally be in accordance with Figure 2. • Service vehicle routes and access points should be screened and/or located away from areas of high pedestrian activity.
Pedestrian Access	• Buildings are to provide clear legible entry points for pedestrian accessibility. • Pedestrian shopping malls are to provide connections to external streets to contribute to an integrated and permeable centre.
Maximum overall Building Height	• Building Heights in accordance with Figure 3. • The maximum permitted building heights as measured in storeys is 15 storeys above NGL. • Buildings within landmark locations are permitted to a maximum height of 20 storeys above NGL. • Structures associated with roof top terraces such as shade structures and alfresco areas are exempted from the prescribed maximum building height. • Plant areas and lift core rooms that are screened from the public domain, however positioned on the roof of an apartment buildings are also exempt from the prescribed maximum building height.
Main Streets	• The main streets may be retained in private ownership providing that legal instruments are put in place to allow for City and public access at all times.

Centre Frame

The objectives of the Centre Frame Precinct are:

- Promote mixed use medium and high density building typologies.
- Provide for additional complementary retail floor space and non-retail floor space growth to encourage activity and support the core retail district.
- Encourage a high quality built form that incentivises pedestrian movement and directly links the Centre Core, Centre Frame and the Residential Precinct through a positive pedestrian experience.
- Promote greater housing density with managed interfaces to surrounding residential areas and transport corridors.

The following development requirements apply within the Centre Frame precinct:

Table 5: Centre Frame Development Controls

Element	Controls
Residential Development	All residential development proposed within the Centre Frame shall be in accordance with the requirements of State Planning Policy 7.3, Residential Design Codes Volume 1 and Volume 2 (Apartments).
Non-Residential Development	All non-residential development proposed within the Centre Frame shall be in accordance with the requirements of the City of Melville's local planning policy 2.1 (Non-Residential Development).
Minimum Lot Size	No further dwelling yield is permitted for lots less than 1,500m^2.
Plot Ratio	No plot ratio applies. Development shall be controlled by setbacks and building height.
Frontages	• A frontage type has been allocated for street frontages on the Figure 2. • Frontage types have been identified to ensure activity and built form responds to create the desired street interface for the relevant street context. • Development shall be in accordance with the relevant frontage requirements under this part. • The frontage types, in order from highest to lowest activation are: – Active – Passive – Landscaped – High Speed

Element	Controls
Active Frontages	This frontage type is proposed for areas in the Centre Core precinct as shown on Figure 2. This frontage will cater for those areas that are projected to have frequent pedestrian movement, requiring street level activation, visual engagement and main street principles to be incorporated into the built form. Development that occurs within these locations shall be in accordance with the following: **Setbacks** • Nil setback to buildings are permitted for the first 5 storeys above NGL. Building setbacks may be considered where active uses are proposed (such as alfresco dining) where a setback can facilitate greater interaction with the street. • 6 storeys and above shall achieve a minimum setback of 5 metres from the façade of the podium level below (excluding podium level balustrades). **Building Mass and Form** • Building facades to maximise engagement to the street by: – Appropriate façade glazing treatments; – Entrances and windows oriented towards the public realm; – Avoiding expanses of blank walls; – Awnings being provided along the building frontage with sufficient width to provide pedestrian shelter.
Passive Frontages	This frontage type is proposed for areas which are highly visible but do not necessarily accommodate highly active functions as shown in Figure 2. High quality design features are to be provided in façade elements, in accordance with the following: **Setbacks** • 2m building setbacks are to apply for passive frontages fronting Gilbertson Road. • Nil setback required to all other frontages. Building setbacks may be considered where active uses are proposed (such as alfresco dining) where a greater setback can facilitate greater interaction to the street. **Building Mass and Form** • Building facades to maximise articulation and architectural features of visual interest. • Awnings to be provided along the building frontage where practical to provide pedestrian shelter.
Landscaped Frontages	This frontage type is intended to buffer and or screen the impacts of servicing back of house environments as well as improve interfaces that are otherwise restricted in providing a visually appealing environment, as shown in Figure 2. Landscaping in these environments shall be in accordance with the following: **Landscaping Buffers** • Landscaping shall be provided extensively for these frontages with a combination plantings and landscaping screens (both hard and soft) to buffer the buildings interface from abutting street frontages.
High Speed Frontages	This frontage type reflects built form that this experienced from passing vehicles where pedestrian movement is predominantly low, as indicated in Figure 2. **Setbacks** • Nil setbacks to buildings permitted to North Lake Road. • Where vehicle parking is proposed, landscaping and screening is to be incorporated so as not to visually dominate street frontages. **Building Mass and Form** • Building facades to incorporate variations in depth, height, colour, texture and/or materials as well as openings where practical to create interest and visual surveillance.
Landmark Locations	Landmark location sites are identified by Figure 2. Built form at landmark locations shall be treated with additional architectural emphasis such as distinctive roof forms and detailing, complemented by a contrast in materiality. **Setbacks** • A nil setback is permitted for landmark development sites. **Building Height** • To emphasis these corner sites, built form is permitted with additional height of 5 storeys (maximum 20 storeys).

Element	Controls
Road Widening	To allow for the modification of the Gilbertson Road and South Street intersection to create a 'left turn' east bound from Gilbertson Road, a portion of land of approximately 1 metre in width and extending from, and including, the truncation to the entire boundary of Lot 31 to Gilbertson Road shall be ceded to the Crown free of cost as a condition of Development Approval for any substantial redevelopment of the property. The exact dimension shall be determined by the City of Melville in consultation with MRWA. Refer to Figure 4.
Key Public Spaces	On-site open space shall be provided for public and communal use in areas noted for 'key public spaces' on Figure 2.
Retail Floorspace Area	The total net lettable area of all existing and future shop retail development within the core frame area must not exceed 4,457m^2 (existing: 1,457m^2). For the purposes of the ACP, NLA shop/retail floorspace is defined as per the Scheme, but also excludes: • Loading and storage areas • Any children's play area and/or equipment; and • All areas (including any seating areas) associated with eating and entertainment uses. Prior to the consideration of proposals for development which exceeds the shop-retail floorspace area identified above the responsible authority will require the preparation of a Retail Sustainability Assessment (or similar), in accordance with SPP 4.2.
Non-Retail Floorspace Area	The total net lettable area of all future non-retail development within the Frame area must not exceed 7,000m^2 (existing: 3,000m^2).
Vehicle Parking and Access	• Car parking for all residential development shall be provided in accordance with the requirements of the Residential Design Codes of Western Australia. • Car Parking for all non-residential development shall generally be provided in accordance with the City of Melville's applicable Local Planning Policy, unless supported by a suitable parking needs study and implemented in accordance with an approved parking management plan. • Vehicle access points shall generally be in accordance with Figure 2. • Service vehicle routes and access points should be located away from areas of high pedestrian activity.
Pedestrian Access	• Buildings are to provide clear legible entry points for pedestrian accessibility. • Pedestrian shopping malls are to provide connections to external streets to contribute to an integrated and permeable centre. • A 1.5m pedestrian footpath is required to be provided along the east-west main street connection from Gilbertson Road to the 'Core'.
Maximum overall Building Height	• Building Heights in accordance with Figure 3. • The maximum permitted building heights as measured in storeys is 15 storeys above NGL for Lot 31. • The maximum permitted building heights as measured in storeys is 4 storeys above NGL for Lots 21-30 fronting Gilbertson Road, with a fifth storey permitted where setback 5 metres from the floor below. • Buildings within landmark locations are permitted to a maximum height of 20 storeys above NGL. • Structures associated with roof top terraces such as shade structures and alfresco areas are exempted from the prescribed maximum building height. • Plant areas and lift core rooms that are screened from the public domain, however positioned on the roof of an apartment building, are also exempt from the prescribed maximum building height.
Main Street (East-West Connection)	• The main streets may be retained in private ownership providing that legal instruments are put in place to allow for the City and public to access at all times. This is to be incorporated and considered when a comprehensive development application is proposed. • Future redevelopment proposals must demonstrate the following public realm upgrades along the east-west main street connection: – Shade trees (where none exist) shall be provided along the edges of the east-west internal road network to contribute to the main street environment to enhance the relationship with the public realm. – Upgrades to the treatment of the road surface of the east-west connection must be demonstrated during the consideration of a comprehensive development proposal. The road surface treatment must accord with the paving pattern from the north-south main street.

Residential

The objectives of the Residential Precinct are:

- To offer a diverse range of medium density grouped and multiple dwelling housing opportunities.
- To ensure built form and building height provides for an appropriate transition into surrounding existing residential areas.
- To provide a density that will support the viability and vitality of the Centre and will support public transport infrastructure and reduced car use.

The following development requirements apply to the Residential Precinct:

Table 6: Residential Development Controls

Element	Controls
Residential Development	Residential density and development standards shall be in accordance with State Planning Policy 7.3, Volume 1 and Volume 2 (Apartments). Residential development adjacent to open space shall be oriented to provide passive surveillance over the public domain.
Road Widening	• To allow for the modification of the Gilbertson Road and South Street intersection to create a 'left turn' east bound turning lane from Gilbertson Road, and left turn west bound turning lane from Gilbertson Road, a condition will be imposed at the time of Development Approval for any substantial development for a portion of land to be ceded free of cost to the Crown, refer to Figure 4. Whilst the exact dimension shall be determined by the City of Melville in consultation with MRWA at the time of Development Approval the land to be ceded will generally be: – 2.4 metres in width abutting Gilbertson Road for Lots 22 (no. 75) No 21 (No's 77 and 77A) Gilbertson Road – including the truncation; and – 3.5 metres in width abutting Gilbertson Road for Lots 155-157 (No's 84-86 (inclusive) – including the truncation.
Bonus Density and Height	For lots impacted by road widening outlined above, Development Approval may be granted for an additional 2 storeys and an additional plot ratio of 0.7 (further variations may be provided at the discretion of the local government where the development satisfies the relevant Design Objectives of SPP 7.3)
Dual Density Coding	In a dual coded area, when considering an application for development or subdivision approval, the lower density code will apply to the land. The approval body can consider development to the higher density code applicable, when a land parcel size is 1,200m^2 or greater.
Grouped Dwelling Parking	Only one dedicated car parking bay is required for grouped dwelling environment.
Minimum Lot Sizes	The following lots must be amalgamated, prior to the determining authority supporting any further development. **Parcel 1** • Strata Plan 73313 (No.13a, 13b, 13c) Burney Court. • Lot 6 (No.15) Burney Court. • Strata Plan 49915 (No.31a, No.31b) South Street. • Lot 159 (No.29) South Street. • Lot 158 (No.27) South Street. **Parcel 2** • Strata Plan 47521 (No.14a, 14b, 14c) Burney Court. • Lot 162 (No.35) South Street. • Lot 161 (No.33) South Street. **Parcel 3** • Strata Plan 44069 (No.1/13, 2/13, 3/13) Hodgson Place. • Strata Plan 42443 (No.15, No.17) Hodgson Place. • Lot 165 (No.41) South Street. • Strata Plan 57072 (No.39A, 39B) South Street. • Strata Plan 44069 (No.5/13, 4/13) Hodgson Place.
Vehicle Access	No vehicle access shall be supported onto South Street.
Pedestrian Footpath	If no footpath exists within the road reserve, a condition of development or subdivision approval should be imposed, to require the applicant to make a contribution to the City of Melville for the provision of a footpath relative to the length of the lot frontage at half the cost determined by the City.
Street Tree	In circumstances where no street tree exists within immediate adjacent verge, a condition of development or subdivision approval should be imposed which requires the applicant to install 1 street tree within the verge. The applicant is required to maintain the street tree for a two year period to the satisfaction of the City. The location and species of the verge tree is required to be confirmed by the City, prior to being undertaken.

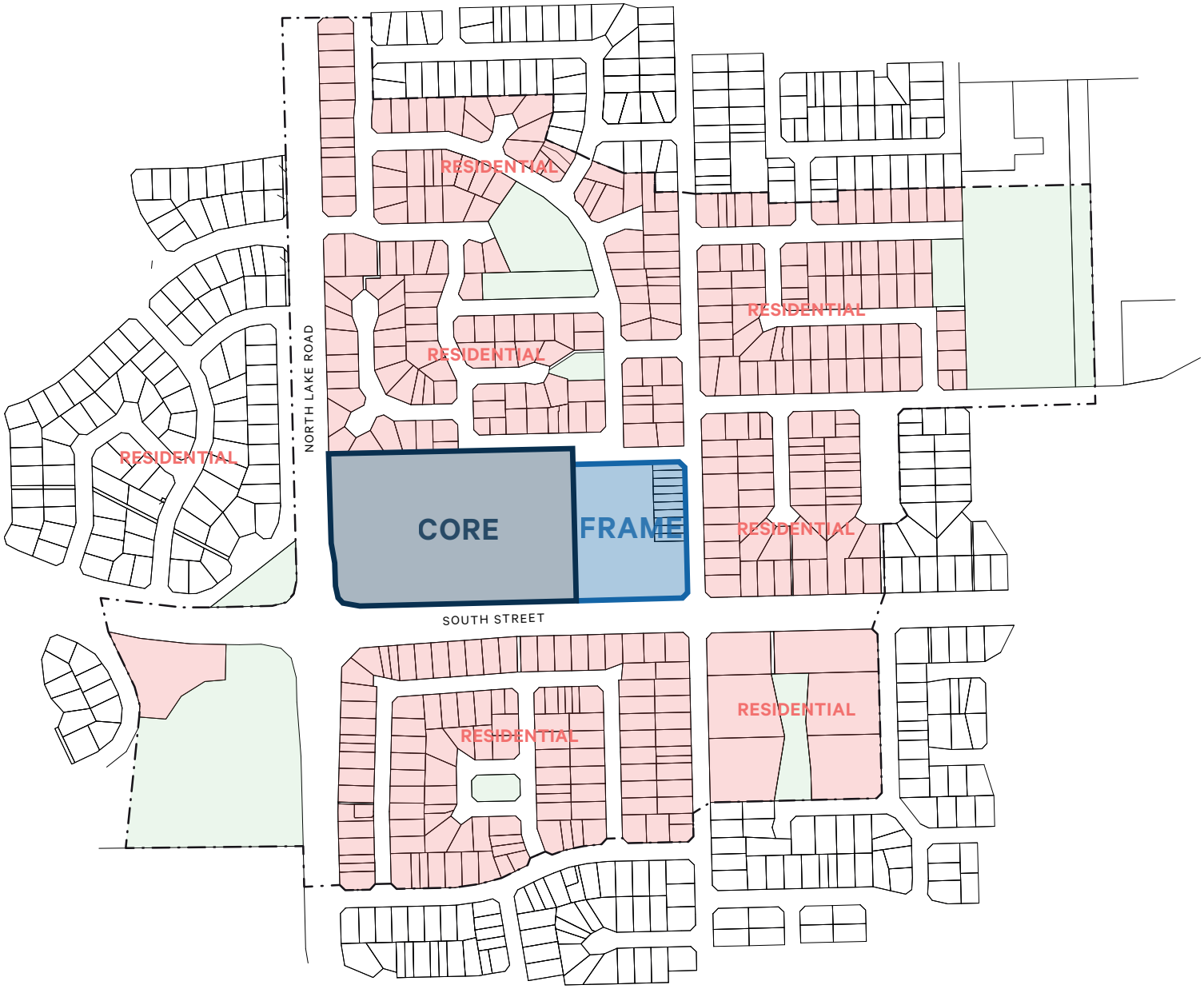


Figure 5. Precinct Map

Part 2: Non-Statutory (Explanatory) Section

1. Introduction and Purpose

This document forms part two of the Kardinya Activity Centre Plan and is intended to be explanatory in nature and provide the rationale behind the provisions of Part One. The ACP will be used by the WAPC, Department of Planning, Lands and Heritage (DPLH), other state government agencies, the City, landowners, business owners and developers, to inform more detailed planning and provide certainty of what is envisaged for the Kardinya Activity Centre.

The City's Local Planning Strategy seeks to concentrate population growth and development in Activity Centres and along public transport routes, which allows suburban areas to remain similar or the same as they are now.

The WAPC's Structure Plan Framework (August 2015) states that:

> *"An Activity Centre plan guides the types of land uses and the overall development (including built form) that is intended to occur within the Activity Centre. It can detail land use and infrastructure requirements as well as environmental assets, residential density, built form, infrastructure and access arrangements".*

The Kardinya 'District Centre' is one of six 'District Centres' in the City that are a prime focus for population growth and redevelopment. Background analysis work was completed for the Centre in 2013 (through the Local Commercial and Activity Centres Strategy – LCAS), including an opportunities and constraints analysis and initial visioning. The ACP is required to achieve the aims of the Local Planning Strategy and the LCAS for the following reasons:

- Activity Centres such as Kardinya District Centre, are expected to assist in accommodating the in-fill dwelling targets set by the Central Sub-Regional Framework by 2050;
- The existing planning framework does not provide a vision for the Centre or planning controls for landowners to redevelop sites in accordance with an overarching vision for the Centre; and
- The WAPC SPP 4.2 requires that ACP's be prepared for all centres that are classified as 'District Centres' and above.

This ACP will be the read in conjunction with the City's LPS6, SPP42 and Peel and State Planning Policy 7.3: Residential Design Codes Vol. 1 and 2.

1.1 Vision for Centre

The Kardinya Activity Centre will continue to evolve as a mixed use centre that provides for the needs of the existing and future Kardinya community. The Centre vision is established as follows:

> *'The Kardinya centre will be a vibrant and exciting focal point of entertainment, hospitality and retail services to create a contemporary, localised centre to accommodate all user's needs in the one location, supported by a higher density residential precinct.'*

In structure planning terms this vision translates into a clear set of principles. The Kardinya Activity Centre will:

- Be a distinctive and attractive centre that capitalises on existing built assets.
- Have a spatial layout that facilitates the connectivity of the Centre with residential areas and other centres to support the intensification of employment, recreation and residential uses within the Centre over time.
- Improve the quality of pedestrian experience to create a pleasant and attractive Activity Centre that people want to interact with.
- Fulfil its district function and complement the activities in surrounding centres.
- Provide for the evolution of the Centre to provide a truly mixed use, transit oriented and connected centre with high levels of amenity for existing and future residents.

1.2 Rationale for Precincts

The ACP proposes to divide the Centre and surrounding residential lots into 3 precincts. The methodology behind this decision is to adequately plan for and guide future redevelopment relevant to the zone and likely outcomes for each of the precincts based on a high level of understanding and analysis of the area. Historically, the District Centre has always been separated into Core and Frame precincts, with Lot 17 being established as the predominant commercial hub as the Core, whilst Lot 31 being located within the Frame, intended for lower intensity commercial uses and activity.

Unlike many District / Secondary Centres, Kardinya is unique in the fact that the Centre is divided into two halves, Lot 17 and Lot 31. This landownership fragmentation is uncommon with medium to large scale centres within the Perth Metropolitan Area. This segregation in landownership has made it challenging to coordinate and plan for a cohesive outcome for redevelopment opportunities as there are commercial constraints such as long term leasing agreements which will restrict the short - medium term redevelopment opportunities particularly for Lot 31.

Whilst an ACP should plan for a ten year period, the ACP prepared has needed to look beyond this to plan for future redevelopment opportunities that are likely to occur. In doing so, separating the Core and Frame has been essential to suitably planning for and mandating development outcomes relevant to the redevelopment capacity of both of the lots. This has been informed by the RSA prepared by Urbis, as well as understanding the future demands of the area. Lot 31 will unlikely accommodate the level of commercial capacity that exists for Lot 17. This has been the defining factor in delineating the Core from the Frame. The Frame has also been identified as having the greatest ability to accommodate residential density, that otherwise would not be appropriate in the Residential Precinct. The Frame provides a transitional precinct that will provide a combination of both residential and commercial land uses and transition into a mixed-use hub. It is not considered viable given the hierarchy of Activity Centres, that the Frame will be able to accommodate commercial growth that is on par with Lot 17 given there simply isn't the current residential catchment to accommodate two large commercial centres.

The Core is defined as Lot 17 (No.1-15) South Street, Kardinya better known as Kardinya Park Shopping Centre. The Core is the Centre of the commercial activity, providing a range of shopping, entertainment and recreational opportunities. The Core best defines what is the main attraction to the Kardinya District Centre both now and with consideration to the future redevelopment. The Core will include a Discount Department Store (DDS), full line supermarkets, range of speciality shops, as well as a medical centre. The 'Core' is also envisioned to provide residential apartments to contribute to the dwelling target of achieving 35 dwellings per hectare for the District Centre. The existing centre within the Core contains approximately 13,776m2 of commercial floorspace. The proposed redevelopment will seek to increase the total commercial floorspace to approximately 28,000m2. In addition to this, the RSA concluded that an additional 1,000m2 of retail floor space and 2,000m2 of non-retail floorspace remained in the catchment for any future modifications to the Core.

The Frame is defined as Lot 31 (No.17-23) South Street, Kardinya. This site currently contains a range of medical services, take-away food outlets, one supermarket and small office spaces. The site has an approved retail floorspace of approximately 1,500m2 and non-retail floorspace of approximately 3,000m2. As mentioned above, the short-term redevelopment opportunities are limited given the commercial units are under separate titles, as well as larger tenants having long term leases. The RSA concluded that an uptake of 3,000m2 retail floor space was achievable with a remaining 4,000m2 of non-retail area. As reflected by the RSA, the Frame has a lower commercial floorspace uptake further reinforcing the need to separate the lots into different precincts given the difference in the uptake in floorspace, which will determine the redevelopment opportunities both within the Core and the Frame.

The surrounding area of the Core and Frame will be defined as a Residential Precinct proposing to intensify density to permit a range of housing typologies from detached grouped dwellings, terrace housing, walk-up apartments to higher density apartments. Residents within the Residential Precinct will enjoy high levels of access to commercial facilities and services.

This diversity of housing options will support the economic and social vibrancy of the ACP area, ensure a richer demographic mix and provide housing options for a wide range of people enabling them to remain in the community as they move through different stages of their lives.

The proximity of these properties to the Core and Frame area, will enable residents to take advantage of the public transport, local employment, retail, commercial, medical, recreational and entertainment facilities within a 400 metre walkable catchment .

1.3 ACP Themes

The Kardinya ACP is underpinned by 4 key themes which describe the areas that need to be addressed in implementing the above vision. The 4 key themes are urbanism, connectivity, vibrancy and economic growth as outlined below.

Urbanism

With the implementation of in-fill in existing suburbs there has been some resistance to change to typically suburban low-density contexts. As clearly outlined within the City of Melville's Local Planning Strategy, the wider locality will need to change from a suburban to an urban environment over the next few decades and hence mitigating the impact of change on the existing suburban context is an important factor in the success to the implementation of this plan.

Ultimately intensification of the area within direct walkability of the main attractor of activity which has excellent access to public transport, allows for the remainder of the suburban context to remain unchanged which will preserve larger areas of typically low-density housing stock areas.

Connectivity

The Kardinya Activity Centre has strong transportation networks linking the Centre with the broader region, into the surrounding residential areas and other Activity Centres. The Plan will promote increased walkability through the Centre – namely from the Frame into the Core. Providing a critical mass of residential density in key locations will make the existing public transport services more viable in the locality. Over time, with increases to density, the patronage of the public transport servicing the area will increase which will provide the necessary nexus for additional investment in public transport infrastructure in the future (i.e. light rail or dedicated transit lanes).

Vibrancy

The Kardinya Activity Centre will provide a range of uses, at a variety of development intensities with activation throughout the day and into the evening in the Core and Frame of the Centre. The activated spaces, along with excellent building design, will ensure that actual and perceived safety is maximised for residents and visitors. This will be achieved through the concealment of car parking and by providing a more attractive pedestrian environment throughout the Centre.

The connection between the built form, network and land uses mix will create an environment where people can easily interact. The Centre will be highly used by the residents who live within the Activity Centre as well as the wider catchment area. It will become a key hub of activity for the community, where social networks can be developed and social transactions occur, resulting in a more connected and vibrant identity. As the Centre develops into an urban context, so too will economic and community relations, which in turn will deliver social and economic benefits to the locality.

Economic Growth

The Core and Frame of the Centre will contribute towards the daily and weekly shopping needs of the locality as well as providing additional local employment. The ACP will further create opportunities for further investment in the locality by a range of stakeholders through new housing and commercial opportunities.

1.4 Community and Stakeholder Engagement

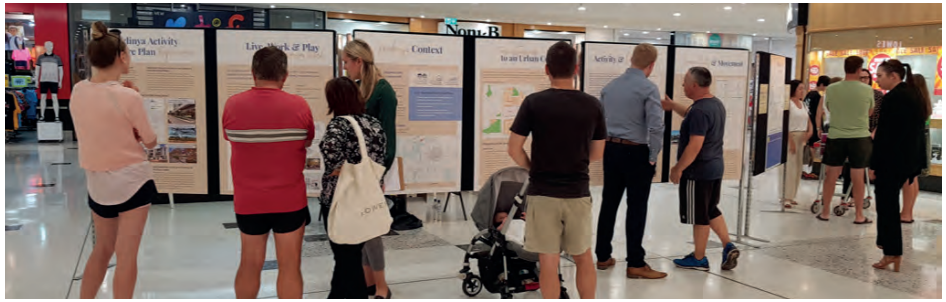
The Kardinya ACP proposes a number of significant changes of how housing, activity and land use may change for the current and future residents of Kardinya and its surrounds. In anticipation of future statutory public consultation, it was identified that early community stakeholder consultation and communications would be critical to the success of the ACP process.

Prior to consultation several technical studies were undertaken as part of catchment investigations, including transport, servicing and infrastructure and retail sustainability. These findings formed the basis of communications distributed via an online community survey, community open house session and other online collateral which is discussed in more detail below.

Extensive preliminary market research in early 2019 including primary and secondary (quantitative and qualitative) was executed by Close at Hand Consultants. Though this focussed on the Centre and its redevelopment, it included questions on the interest in on-site apartments as follows:

- A total of 26% of all respondents indicated that they are interested in buying or renting a residential apartment around a shopping centre, with 8% being 'very interested'. The closer the respondents lived to KPSC the higher their interest.
- 75% were interested in buying, rather than renting (which equals 19% of all respondents), and apartments in a price range between $250,000 and $500,000 were considered most popular (12% of all respondents would be interested).
- Qualitative feedback suggests that the area in general and the location at KPSC in particular are considered ideal for apartments.

The research also modelled and mapped where the Centre's clientele originate; the Centre has a very large catchment that live within walking distance. The research also shaped the DA, and therefore the Centrepiece of the Activity Centre in so far as it confirmed the desire for a true town-centre rather than a shopping centre.



Engagement activities for the Kardinya ACP included:

- Distribution of 5000 flyers to residents living approximately 400m from the shopping centre, as well as distribution within the shopping centre itself;
- Door-knocking of several hundred adjacent residential neighbours to inform them of the next stage of the project, managed by PR company Clint Ford & Associates;
- Developing additional ACP collateral for distribution on the existing project website, https://kardinyapark. news, as a single source of information;
- Produced Frequently Asked Questions for distribution online and in person to community and stakeholders;
- Release of a community online survey capturing the thoughts of 46 people; and
- Hosted a 4-hour community drop-in session, with the project team meeting over 191 shoppers and residents to view ACP plans and ask questions.

Analysis Limitations

One of the challenges identified by the project team was ensuring messaging for the ACP was not confused with the recent Kardinya Park Shopping Centre Development Application (DA). Separate public consultation was conducted by the City of Melville alongside the ACP engagement to encourage formal submissions from community members and stakeholders. Promotion for the public consultation process had also received local media attention and postings via the City of Melville social media. Dedicated ACP information has been available on https://kardinyapark.news/ since January 2020.

Online Community Survey

element prepared and distributed the Kardinya ACP community survey between 23 January and 30 January 2020. The fifteen questions were a combination of qualitative and quantitative and leveraged off findings from technical studies. Participants were provided with background information to consider as they were completing their survey which mirrored that of the open house session displays (see below).

In total 46 responses were received which identified the following key themes below:

- A modest increase of appropriate density within the ACP was generally accepted by respondents. 45% of respondents (17) felt that the proposed densities were appropriate to address issues of urban sprawl, quality of life, access to facilities and/or population growth. A further 26% (10) said they were unsure about the proposed densities.
- Respondents were more likely to accept an increase in height/densities when there was assurance that new builds would be of high quality and not negatively impact existing residential houses in terms of character and traffic movement.
- Leafy green suburbs and a better pedestrian experience is highly valued by respondents. This included more provision for shade (i.e. street trees), seating and safer footpaths. Safe intersection and road crossing were consistently identified as improvements needed within the immediate area when accessing Kardinya Park Shopping Centre.
- When asked what long-term population growth issues are important to them the top response was access to nearby services followed closely by access to frequent public transport. The least important issue was an increase of investment opportunities. Conversely, almost all people who said that investment was very important to them was a current resident of Kardinya.
- Broad concerns and queries about how an increase in density and people living in the area may affect traffic movement, property prices, character and future demographics in the area. Roughly a quarter of respondents expressed concern for an increase in height and densities impacting on the surrounding neighbourhood.
- Public transport was the highest rated mode of transport currently operating within the Kardinya Activity Centre followed by walking, personal vehicle and finally cycling (discounting respondents who said they did not use that mode of transport).

Demographic information collected during the survey revealed the following about respondents:

- Nearly two thirds (62%, 28) of respondents lived in Kardinya at the time of undertaking the survey.
- Survey respondents were most likely to have lived in their current suburb for over 20 years (41%, 19). Of those long-term residents, 74% (14) are currently living in the suburb of Kardinya.
- 80% of respondents considered themselves to live close to the shopping centre. Ten individuals (22%) said they lived within the 400m radius of the shopping centre.
- Most respondents (70%, 32) said that this was the first time they had engaged with either the redevelopment project or the ACP at the time of undertaking the survey. 11 individuals had engaged with the project team back in November 2019.

Community Open House

The project team hosted a Community Drop In session on the evening of Thursday 23 January 2020 from 3pm – 7pm. The session was hosted at Kardinya Park Shopping Centre in front of Kmart with a number of A0 posters detailing the drivers for the Kardinya Activity Centre Plan, considerations for planning for population growth, proposed R-Code changes, options for medium and medium-high density housing and a call to action for the community to give feedback on the proposed ACP.

In attendance from the project team was the project manager, three planners, an engagement specialist and a PR consultant.

Community members and store owners were invited to 'drop in' at any time to view the posters, speak with a member of the project team, ask questions and pick up a set of FAQ's. In total approximately 191 people visited the project team during the drop-in session.

Conversations with community members highlighted the following sentiments as well as observations from the project team:

- Local community members were readily able to understand the need for considered planning for future housing, activity and land use to address the accepted reality of local population growth;
- The Kardinya Park Shopping Centre, and its potential redevelopment, is a valued asset in the community and any future density increases would be a drawcard for new residents;
- Many people viewed the ACP as a tool to help connect the shopping centre with those living south of South Street through improvements to the pedestrian/cycling links;
- Future medium-high density housing should be affordable, high quality and work well with the surrounding neighbourhood; and
- Some concern regarding the height of apartments closest to Kardinya Park impacting on traffic and current residents, including anti-social behaviour.

Overall it was observed that community members were interested in future plans of the Activity Centre with most appreciating the need for in-depth investigations to accommodate a growing population.

1.5 Land Description

The Kardinya District Centre is a strategic Activity Centre located:

- Approximately 15 kilometres south-west of the Perth Central Business District;
- Approximately 7 kilometres east of Fremantle;
- Approximately 3.5 kilometres west of the Murdoch Train Station; and
- On an important public transport route – South Street – which provides bus services between Fremantle and Murdoch Station.

It is one of eight Activity Centres within (or partially within) the City of Melville. The land tenure is fragmented and under the ownership of many different landowners with approximately 629 residential dwellings within the ACP area.

The Kardinya ACP area has been guided by the performance targets under SPP 4.2 which sets out a 400 metre walkable catchment to define the boundary of the ACP from the Centre point of Kardinya District Centre. However to deliver well-integrated and cohesive streetscape environments, the ACP boundary has slightly been extended to exceed this 400 metre radius. This has also been investigated at the request of the WAPC and the City following preliminary engagement.

The ACP boundary has been defined by a series of overarching design principles to deliver a plan that whilst will transition Kardinya into an urban and active precinct, also recognises the existing sense of place that has existed since the establishment of Kardinya. To ensure, both outcomes are integrated, a high level of investigation has been undertaken to reduce high density and low density interface conflicts. Notwithstanding this, it also needs to be recognised the strategic position of Kardinya, and the current undersupply of housing diversity and amenity for residents, students and the local workforce. In this regard the plan that has been prepared seeks to build on the existing foundation of Kardinya and transition the suburb into the next 30 years of growth and development.

The Central Sub-Regional Planning Framework: towards Perth and Peel @ 3.5 million utilised a 'Core and Frame' approach to help define Activity Centre boundaries. This approach has also been used in this plan. The Core is the main retail/commercial area and the Frame provides for a mixed use residential opportunity. In addition, the surrounding residential precinct will provide a transition in height and density to protect lower density lots' amenity outside of the catchment whilst still allowing for future intensification along major transport routes as outlined in the City's Local Planning Strategy.

The proposed centre boundary is considered appropriate in this context but will be the subject of community consultation as part of the public advertising of the plan.

1.6 SWOT Analysis

Strengths

- Identified 'District Centre' on an important public transport route;
- High frequency public transport connections;
- Commercial uses have high visibility to passing traffic;
- Existing 'attractor' uses including Kardinya Park Shopping Centre, Kardinya Tavern, ALDI, Morris Buzacott Reserve, Alan Edwards Park, North Lake Senior High School, Kardinya Primary School, Fiona Stanley & St John of God Hospitals and Murdoch University;
- Compact geographical area;
- Relatively good parent lot sizes for existing residential lots with parent lots being typically 700 – 800m^2 in area;
- Majority of the surrounding area is single residential with ability for site amalgamation to create larger sites which can be more easily developed;
- Significant amount of older housing stock ready for redevelopment;
- Established street trees and landscaping;
- Majority of area has a relatively good urban structure based on a grid pattern of majority of streets (excluding western side of North Lake Road); and
- Large areas of public open space close-by at Morris Buzacott Reserve and Alan Edwards Park.

Weaknesses

- Older housing stock detracting from the look and feel' of the area;
- Current lack of the amenity and vibrancy for the Activity Centre with limited range of activities and entertainment uses;
- The Core precinct environment is dominated by busy roads and large car parks;
- South Street and North Lake Road act as barriers to movement in north-south and east-west directions (and vice versa) particularly for pedestrians given the deficiencies in the pedestrian environment.
- Car and traffic-dominated environment;
- Poor pedestrian and cycling environments that are perceived to be unsafe and unpleasant;
- The sloping topography impacting on accessibility throughout the Centre;
- Poor universal access (i.e. footpaths, pram ramps, other pedestrian amenities);
- Lack of mature trees and shade over pedestrian footpaths; and
- Poor quality landscaping.

Opportunities

- Under-capitalised and moderately large development sites;
- Potential views to the City skyline from upper storeys due to topography;
- Increasing property values in the vicinity;
- Large area of at-grade shopping centre parking areas;
- Provision of future dedicated bus lanes on South Street to enhance public transport use; and
- Need for housing diversity and housing stock suitable for key workers such as hospital, university and hospitality/retail workers, student housing and elderly.

Threats

- South Street and North Lake Road will remain busy Regional Roads carrying large amounts of traffic (including freight traffic) with noise and dust impacts and limited ability to increase volumes;
- Attracting quality investment into the Centre to ensure high quality built form and development potential is actualised;
- Economic climate may result in an under-development of the Centre with community preference for grouped dwelling developments rather than multiple dwelling developments due to low-socio-economic stigma associated with multiple dwelling developments; and
- Funding for improvements to streetscapes, landscaping and other public realm improvements. The City would need to consider potential capital works projects against long term financial plans and budgets or potentially implement a special area rating to provide for streetscape enhancements.

LEGEND

ACP Boundary

Access Point

Existing Buildings

Strengths

Views to the city

Northern solar aspect

High frequency bus route

Visual exposure from road

Possible commercial

Weaknesses

Pedestrian connections

Poor residential interface

Above ground power line

Opportunities

Passive surveilance

Upgraded open space

Corner activation

Development

Main street

Transition

Threats

High traffic regional road

High value development

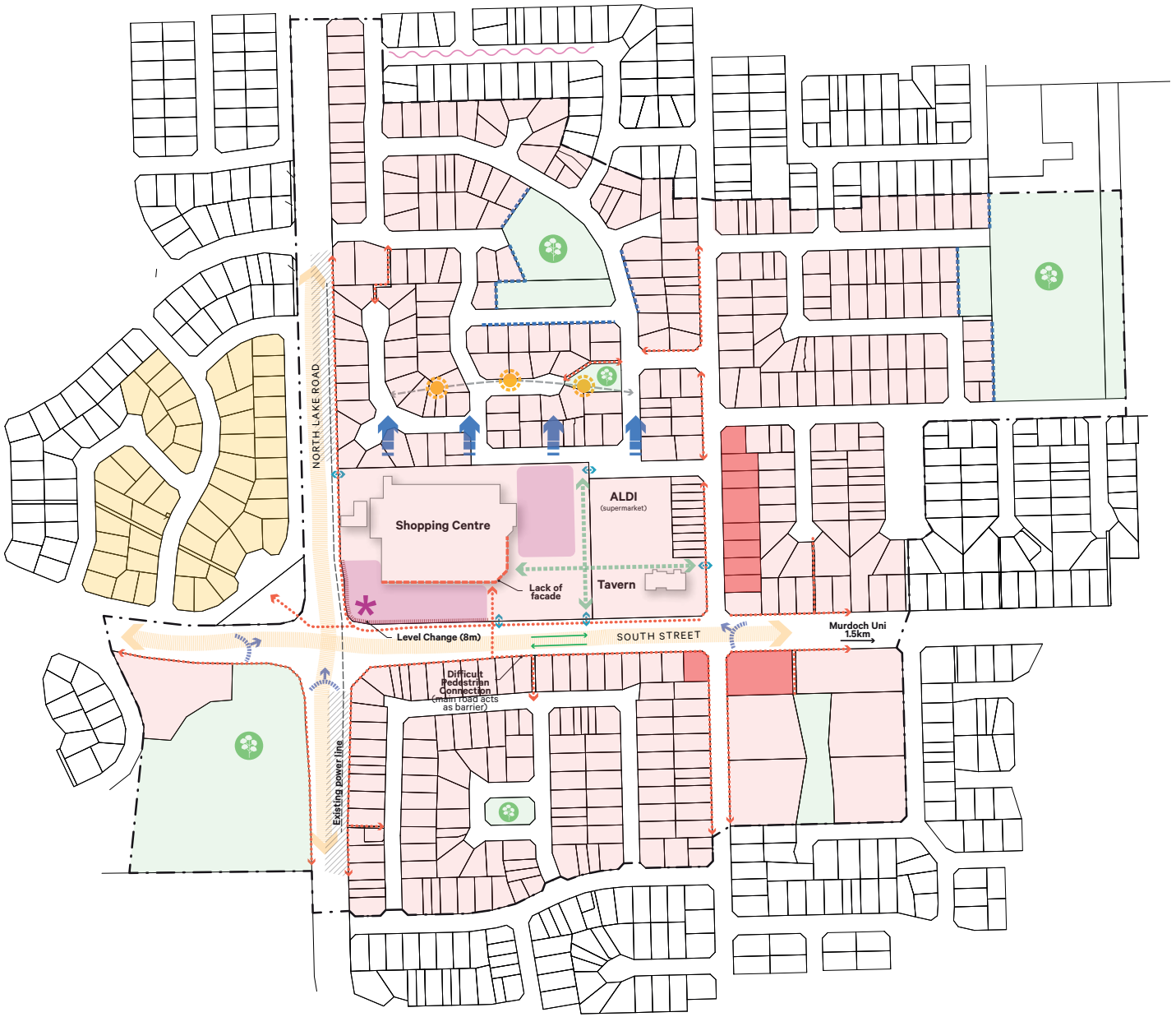


Figure 6. SWOT Analysis

2. Demographic Profile

An analysis of the demographic profile has been provided to support the ACP. The ACP area has been compared to the wider City of Melville local government area and greater Perth region. The demographics have illustrated the following key points:

- The ACP area of Kardinya has a higher median age profile than the greater Perth region. Melville generally has a higher age demographic of which the ACP area is closely aligned to.
- 18-24 age profile is higher than both the wider City of Melville and greater Perth region.
- Group households are higher than both the Melville average and greater Perth region. This is likely attributed to the proximity to Murdoch University.
- The ACP area also has a slightly higher ratio of couples without children.
- Current residents within the ACP boundary, are more inclined to use public transport to get to work.

2.1 Median Age Group Comparison – 2016

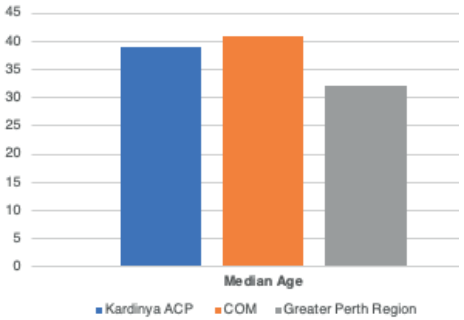


Table 7: Age Group Comparisons – 2016

Median Age	ACP Area	COM	Greater Perth
0-4	5.35%	5%	6.5%
5-11	6.3%	8.3%	9.0%
12-17	5.7%	7.7%	7.2%
18-24	11.8%	9.5%	9.4%
25-34	17.7%	11.5%	15.8%
35-49	17.9%	19.6%	20.9%
50-59	11.6%	13.5%	12.2%
60-69	11.5%	11.8%	9.7%
70-84	9.8%	9.8%	7.5%
85 +	1.9%	3.3%	1.8%

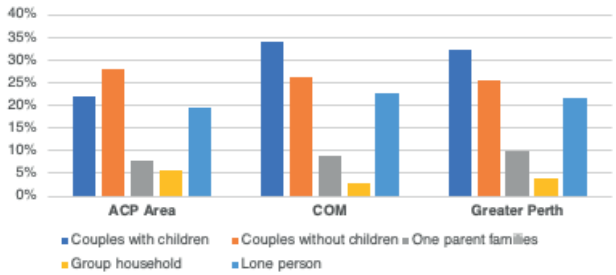


Table 8: Household Type – 2016

Household Type	ACP Area	COM	Greater Perth
Couples with children	22%	33.9%	32.3%
Couples without children	28%	26.2%	25.4%
One parent families	7.9%	9.0%	9.8%
Group household	5.6%	3.0%	3.8%
Lone Person	19.5%	22.5%	21.7%

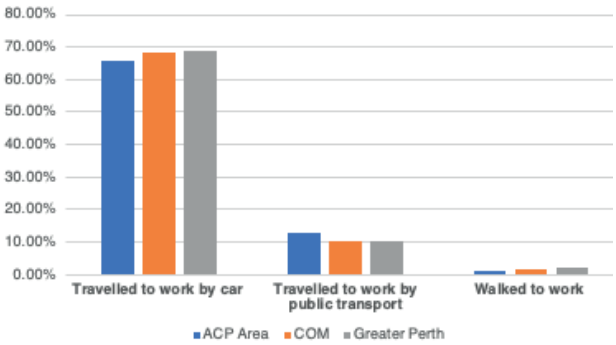


Table 9: Method of Travel to Work – 2016

Method	ACP Area	COM	Greater Perth
Travelled to work by car	68.5%	68.3%	68.7%
Travelled to work by public transport	**12.7%**	**10.2%**	**10.3%**
Walked to work	1.3%	1.6%	2.1%

Notes: All statistics are sourced from .ID Community. COM means City of Melville.

3. Planning Framework

3.1 State Planning Framework

A number of State strategic planning and policy directions have influenced the objectives and resulting provisions of the Kardinya Activity Centre Structure Plan, including the following documents.

Perth and Peel @ 3.5 Million and Central Sub-Regional Planning Framework

Perth and Peel @ 3.5 Million and the associated central sub-regional planning framework provide a high level, spatial vision for accommodating a rapidly expanding population within the Perth and Peel region and recognise the benefits of a more consolidated city whilst also acknowledging the need to provide both in-fill and greenfield development opportunities.

The Central Sub-Regional Planning Framework advocates for greater use of Activity Centres and transport corridors to support a diversity of higher-density accommodation. Activity Centres are identified as being close to transport, jobs and amenities but will need to develop in a way to minimise impact on existing industrial centres and the green network. The Framework applies 10 principles of urban consolidation, which provide the context to planning for infill development, including Kardinya.

The Central sub-regional planning framework identifies the Kardinya Shopping Centre as an Activity Centre with the aim of the Centre to allow more people to live closer to where they work to reduce distances travelled to work as well as to match quality infill with amenity by creating a mix of housing, workplaces, retail and entertainment venues. The framework provides an in-fill target for the whole of the City of Melville of approximately 18,500 dwellings by 2050, focussing on those areas identified for more appropriate infill (i.e. such as Kardinya Activity Centre). This ACP aims to provide 10% of the City of Melville's infill target by facilitating the development of a net dwelling increase of 1,246 dwellings and fulfil one of the key objectives of the central sub-regional framework – to strengthen key employment centres, including Activity Centres to meet the future needs of industry, commerce and the community.

Metropolitan Region Scheme

Under the Metropolitan Region Scheme (MRS) the Activity Centre area is zoned 'Urban' with the exception of South Street (Primary Regional Road reservation) and North Lake Road ('Other' Regional Road reservation). An Urban zoning acknowledges the area is capable of and identified for urban related land uses, such as residential, commercial and retail land uses.

State Planning Policy 4.2 – Activity Centres for Perth and Peel

In 2010, the WAPC released SPP 4.2 which specifies broad planning requirements for activity entre development and renewal. SPP 4.2 focuses on greater diversity in land use, consolidated retail development, quality urban design and walkability.

SPP 4.2 defines an Activity Centre as follows; *"Activity Centres are community focal points. They include activities such as commercial, retail, higher-density housing, entertainment, tourism, civic/community, higher education, and medical services. Activity Centres vary in size and diversity and are designed to be well-serviced by public transport."*

Kardinya Park Shopping Centre is formally recognised as an 'district' Activity Centre and this ACP has been prepared in accordance with the required format and provisions. District centres are defined under SPP 4.2 as follows:

> *"District centres have a greater focus on servicing the daily and weekly needs of residents. Their relatively smaller scale catchment enables them to have a greater local community focus and provide services, facilities and job opportunities that reflect the particular needs of their catchment".*

This ACP has been developed with a diversity of uses and an appropriate distribution of services with respect for the hierarchy of Activity Centre in the wider metropolitan area. This will ensure that the implementation of this ACP does not impact adversely on the operations of other centres.

SPP 4.2 provides residential density targets for each classification of Activity Centres. It is noted that based on these targets the resulting densities have been planned on the premise of achieving the density target of 30 dwellings per hectare within the Kardinya ACP area.

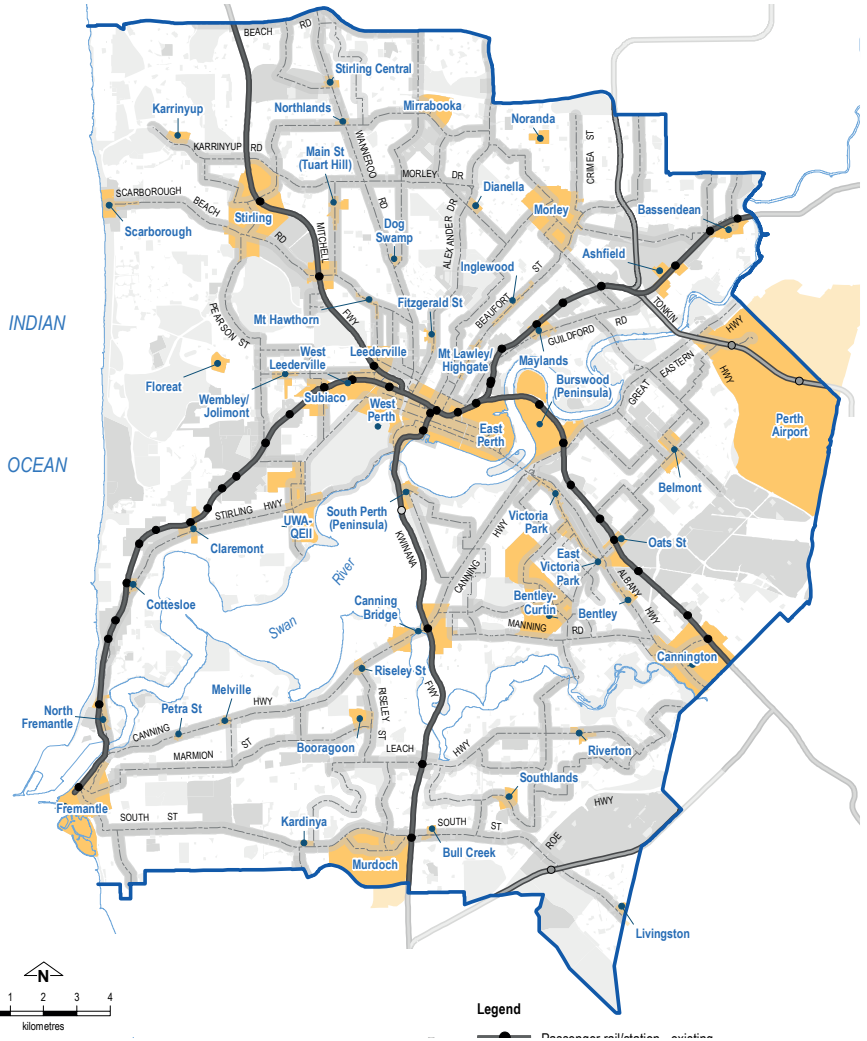


Figure 7. Activity Centre Perth and Peel @ 3.5 Million

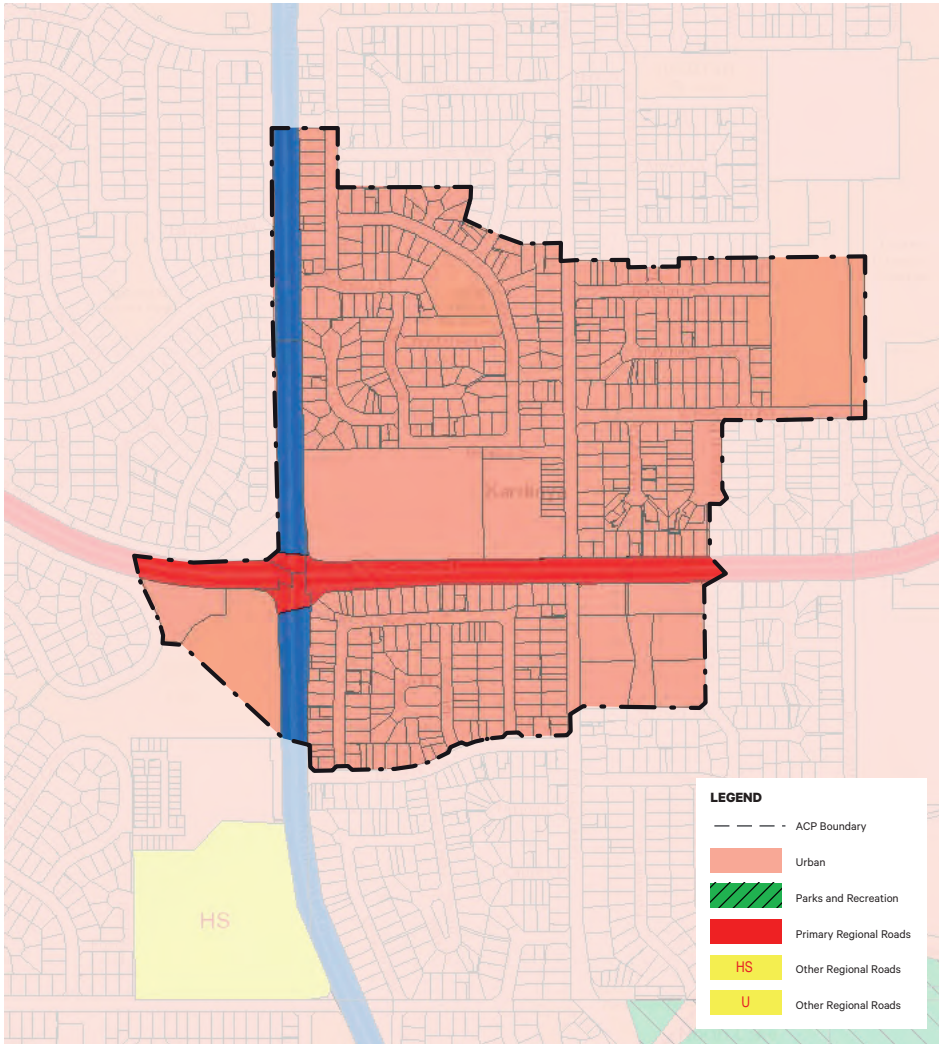


Figure 8. Metropolitan Region Scheme

State Planning Policy 5.4 – Road and Rail Noise

The purpose of State Planning Policy 5.4 (SPP 5.4) is to minimise the adverse impact of road and rail noise on noise-sensitive land-use and/or development within the specified trigger distance of strategic freight and major traffic routes and other significant freight and traffic routes.

SPP 5.4 seeks to ensure that the community is protected from unreasonable levels of transport noise, whilst also ensuring the future operations of these transport corridors.

Urban consolidation brings challenges when planning for land near high frequency/impact transport corridors. SPP 5.4 aims to ensure acceptable levels of acoustic amenity can be achieved through consideration of interface issues that balances reasonable and practical considerations when noise- sensitive land-use and/or development is proposed in areas impacted by road and rail noise.

The objectives of SPP 5.4 are to:

a) "protect the community from unreasonable levels of transport noise;

b) protect strategic and other significant freight transport corridors from incompatible urban encroachment;

c) ensure transport infrastructure and land-use can mutually exist within urban corridors;

d) ensure that noise impacts are addressed as early as possible in the planning process; and

e) encourage best practice noise mitigation design and construction standards."

South Street is a 'Strategic freight and/or major traffic route' (trigger distance 300m from road carriage way edge) and North Lake Road is an 'Other significant freight/traffic route' (trigger distance 200m of road carriageway edge). Noise sensitive land uses (i.e. residential) which are proposed to increase in intensity (i.e. increased density) within the stipulated trigger distances will need to be assessed against this Policy accordingly which will generally require development to comply with quiet house requirements or other noise mitigation measures as specified within the relevant guidelines applicable to this Policy.

Murdoch Specialised Activity Centre Structure Plan

The Murdoch Specialised Activity Centre Structure Plan (MSACSP) was approved by the WAPC in 2014 and provides high level strategic guidance for the future of the Murdoch Precinct, however, also contains the strategic intent for the broader area surrounding Murdoch which extends to Kardinya.

The structure plan sets out 8 precincts, of which Kardinya is contained within Precinct 8, defined as the Suburban Frame. The Suburban Frame covers an extensive area, that is spread across multiple suburbs which include, Bull Creek, North Lake, Bateman, Leeming and the northern part of Coolbellup.

The Suburban Frame precinct is set out within MSACSP as per the following:

> *"The surrounding residential suburbs largely abut the proposed strategic transit corridor along South Street. They present opportunities to increase densities and improve local convenience retail/ services. Particular support will be applied to the eastern corridor along South Street in the vicinity of Murdoch Station, where public transport journeys can be maximised and where there may be scope for redevelopment of more significant tracts of land for mixed use or high- density residential living. The activity nodes which house the two district shopping centres of Bull Creek and Kardinya present opportunities to evolve into local hubs with a mix of activities and more attractive urban form."*

Kardinya Park Shopping Centre is nominated within MSACSP as an activity node serving the district and neighbourhood catchment, playing a complimentary role to the Murdoch Activity Centre. Whilst the MSACSP core focus is on Murdoch, the Specialist Activity Centre Structure Plan, supports the redevelopment of smaller retail based centres into more diverse places of activity and urban form, of which is consistent with the intent of the proposed redevelopment of the Centre.

MSACSP contains no delineation of Precinct 8 as to how to approach density increases within this nominated area. Given the expansive area that is identified within MSACSP that relates to precinct 8, the ACP has focused densification around the District Centre in accordance with SPP 4.2. It is deemed that the extent of which Precinct 8 extends should be fragmented, and subject to separate investigations, given the high level nature of the document, and limited strategic investigation on the wider frame area that has occurred via this document. Kardinya District Centre and the wider residential catchment surrounding as indicated in Figure 9, has been identified as a low-rise neighbourhood, with an intended height prescription between 2-3 storeys and 6 storeys in certain locations. The height of 2-3 storeys in a 400 metre catchment would not provide the adequate density envisioned under SPP 4.2 for a District Centre. In this regard, a slight increase in building height is required within the immediate vicinity of the District Centre to appropriately deliver density. Notwithstanding this, the heights are mostly consistent with 2-3 storeys particularly around the periphery of the ACP. MSACSP also prescribes for the Kardinya District Centre to achieve a minimum 35 dwelling per hectare. The total area of the District Centre is approximately 6.6ha which would require 231 dwellings to be built within the District Centre to achieve this target. For the purposes of this ACP 200 dwellings have been projected to be built within the Centre Core and Frame, however both sites have the potential to achieve this target.

Figure 9. MSACSP Extract

State Planning Policy 4.2 – Activity Centres for Perth and Peel (SPP 4.2)

This document is the WAPC's guiding policy for planning and development of Activity Centres throughout Perth and Peel. The document was released in 2010, and focuses on greater diversity in land use, consolidated retail development, quality urban design and enhancing walkability. SPP 4.2 nominates Kardinya as a District Centre, which is defined as:

> *'District Centres have a greater focus on greater focus on servicing the daily and weekly needs of residents. Their relatively smaller scale catchment enables them to have a greater local community focus and provide services, facilities and job opportunities that reflect the particular needs of their catchment.'*

SPP 4.2 further sets out within Table 3 performance targets relating to the walkable catchment, residential density, diversity and floorspace performance targets as well as typical retail development seen within District Centres. The proposed ACP is aligned with the objectives of SPP 4.2, by providing the framework to appropriately coordinate development to meet the performance targets defined within SPP 4.2. This includes increasing the residential catchment to align with the 30 dwellings per hectare desired for District Centres, provide controls that will improve pedestrian circulation to reconnect both sites to become a cohesive District Centre and promote a higher demand and useability for public transport within the Centre.

Part 1 of the ACP also provides clear guidance on the retail floor space capacity for the District Centre, which is essential in understanding the role of the Centre within the hierarchy, but also the projected redevelopment outcomes particularly for the 'Frame'. This has been guided by an RSA prepared by Urbis to ensure the uptake in the projected floorspace, firstly is balanced between the two sites and secondly any future redevelopment will not detrimentally impact surrounding Activity Centres.

The rezoning will also enable a greater concentration of residential development that has been allocated to both sites under the ACP. Whilst Kardinya Park will be largely consumed by commercial floorspace, it enables an opportunity for the adjacent site to accommodate medium - high density residential opportunities anchored by the sites strategic location in close proximity to public transport, large employment hubs and good quality public open spaces. This further reinforces the intent under SPP 4.2 to concentrate residential density in close proximity to public transport and employment generators.

State Planning Policy 7.0 – Design of the Built Environment

Draft SPP7.0 is a State Government initiative to ensure good design is at the Centre of all development in Western Australia. It aims to create cities, towns and neighbourhoods where people want to live, work and socialise, now and long into the future.

This Policy seeks to deliver the broad economic, environmental, social and cultural benefits that derive from good design outcomes and supports consistent and robust design review and assessment processes across the State.

This Policy sets out the objectives, measures, principles and processes which apply to the design and assessment of built environment proposals through the planning system and provides the overarching framework for a range of supporting State Planning Policies that provide design quality guidance for specific types of planning and development proposals.

The application of this Policy is namely in design review for larger development proposals and also new Policy framework. Part one of this ACP has been drafted around the 10 key design principles to ensure good design is at the focus of all new major developments. The design principles are as follows:

- *Context and character – respond to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
- *Landscape quality – recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*
- *Built form and scale – ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*
- *Functionality and build quality – meet the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle*
- *Sustainability – optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
- *Amenity – provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*
- *Legibility – results in buildings and places that are legible with clear connections and easily identifiable elements to help people find their way around.*
- *Safety – optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
- *Community – responds to the local community needs as well as the wider social context, providing buildings and spaces that support a diverse range of people and facilitate social interaction.*
- *Aesthetics – is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*

All commercial, mixed use and apartment development applications will need to be assessed against the 10 design principles by both applicants and the City of Melville Design Review Panel and planning officers.

State Planning Policy 7.3 – Residential Design Codes Vol. 1 and Vol. 2

The implementation of Vol. 2 of the Residential Design Codes in May 2019 has the objective to provide comprehensive basis for the control of residential development throughout Western Australia. This Policy guides the various stakeholders in apartment design and preparing development applications and informs the community on the principles of good design and planning practice for development of residential apartments. This Policy will provide the necessary built form controls for the Kardinya Activity Centre area for mixed-use and multiple dwelling development and guide the preparation of any secondary localised controls required.

The Policy objectives for the planning, governance and development process are to:

- *"Encourage design that is responsive to site, size and geometry of the development site;*
- *To allow variety and diversity of housing choices where it can be demonstrated this better reflects context or scheme objectives;*
- *Ensure clear scope for scheme objectives to influence the assessment of proposals;*
- *Ensure certainty in timely assessment and determination of proposals; and*
- *Ensure certainty in timely assessment and determination of proposals applied consistently across state and local government."*

Grouped and single development will need to be assessed against Vol. 1 of the Residential Design Codes. It should be noted that a scoping paper for medium density development was completed on medium density in mid-2019 appropriately named the 'Missing Middle'. The paper is based on information from the development industry, practitioners and local governments as well as conversations with some smaller scale developers and builders who work in the medium density field. At the time of drafting this report, the project is awaiting WAPC endorsement and has not yet commenced and therefore for the foreseeable future, Vol. 1 and 2 of the R-Codes will apply to medium density development in the ACP area.

Development Control Policy 1.6 – Planning to Support Transit Use and Transit Oriented Development

WAPC Development Control Policy 1.6 (DC1.6) seeks to maximise the benefits to the community of an effective and well used public transit system by promoting planning and development outcomes that will support and sustain public transport use. The objectives of DC 1.6 are as follows:

- *"To promote and facilitate the use of public transport as a more sustainable alternative to the private car for personal travel, to enhance community accessibility to services and facilities, including employment opportunities, community services and recreational facilities, and to improve equity in accessibility for those who do not own or have access to a car;*
- *To encourage spatial patterns of development that make it easier to plan and efficiently operate public transport services, and for the existing and potential users of public transport to access those services;*
- *To encourage balanced public transport patronage along transit corridors by creating places that are destinations as well as points of departure;*
- *To ensure the optimal use of land within transit-oriented precincts by encouraging the development of uses and activities that will benefit from their proximity and accessibility to public transport, and which will in turn generate a demand for the use of transit infrastructure and services;*
- *To ensure that opportunities for transit supportive development are realised, both on public and privately-owned land, and that transit infrastructure is effectively integrated with other development, to maximise safety, security and convenience for transit users; and*
- *To promote and facilitate walking and cycling within transit-oriented precincts by establishing and maintaining high levels of amenity, safety and permeability in the urban form, and to promote and facilitate opportunities for integrating transport modes by creating opportunities for convenient, safe and secure mode interchange."*

In addition, DCP 1.6 states:

> *"Higher residential densities and mixed-use development in the walkable catchments of transit facilities have the potential to reduce car dependence; to increase accessibility for those without access to private cars; to reduce congestion on the road network and the demand for new road space; to reduce fuel consumption and air pollution; and to provide quality diverse and affordable forms of housing and development. These benefits combine to produce an attractive and viable alternative to car-based trips."*

The Kardinya ACP acknowledges and incorporates the above strategic direction throughout its various themes.

Liveable Neighbourhoods

Liveable Neighbourhoods (2009) is an operational development control policy and was prepared by the WAPC to implement the objectives of the State Planning Strategy. Liveable Neighbourhoods focuses on promoting walkable mixed-use neighbourhoods where daily needs are within walking distance of most residents and advocates to produce safer, healthier, more sustainable and connected communities. The provisions of this ACP are generally consistent with the objectives of Liveable Neighbourhoods including the following:

- *"To provide for an urban structure of walkable neighbourhoods clustering to form towns of compatible mixed-uses in order to reduce car dependency for access to employment, retail and community facilities;*
- *To ensure active street/land use interfaces with buildings fronting onto streets to improve personal safety through increased surveillance and activity;*
- *To facilitate new development which supports the efficiency of public transport systems and provides safe, direct access to the system for residents;*
- *To facilitate mixed-use urban development which provides for a wide range of living, employment and leisure opportunities capable of adapting over time as the community changes, and which reflects appropriate community standards of health, safety and amenity;*
- *To provide a variety of housing size and type to cater for the diverse housing needs of the community at a density that can ultimately support the provision of local services;*
- *To ensure cost-effective and resource-efficient development to promote affordable housing; and*
- *To maximise land efficiency wherever possible".*

It should be noted that Liveable Neighbourhoods is under review by the DPLH under the Stage 2 of Design WA – with the policy to be renamed 'Neighbourhood Design' and released as a new State Planning Policy. A draft has not yet been released for consultation at the time of drafting this ACP.

3.2 Local Planning Framework

Local Commercial Activity Centres Strategy 2013

The City of Melville commissioned a Local Commercial and Activity Centres Strategy (LCACS) in 2013to provide a framework for future development that allows activity to respond to market needs while encouraging positive outcomes for better functioning Activity Centres whilst mitigating impact on existing areas. A key idea in the LCACS, which is also supported SPP4.2, is to better align employment with residential density which is considered to be one of the fundamental building blocks of sustainable urban form. There are a range of potential advantages associated with Activity Centre-based urban form including:

- *"Locating dwellings near daily or weekly destinations such as schools, employment, recreation, services and shops (or close to a low-cost, efficient transport network) effectively reduces the overall cost of housing. This effect has been quantified as the Housing and Transport Index. This may also provide more equitable access to goods and services for residents;*
- *Concentrating destinations at a node or along a corridor facilitates more efficient and less costly servicing via public transport, reducing the dependence of residents on private vehicles while maximising the catchment of potential users;*
- *Concentrating people in smaller areas of land reduces the need to continually expand the boundaries of the urban area, which will in turn reduce the need to use land valuable for habitat, agriculture or other natural resources use or conservation;*
- *Delivery of essential services, such as water, power, communications and waste removal services may be more efficient in an area of higher population density; and*
- *Reduce the consumption of resources, including water, fuel, electricity and building materials."*

The LCAS outlines that the framework for assessment of existing Activity Centres within the City of Melville which is as follows:

- *"Activity Centre functions – assigning if population driven or strategic and outlining if known the aspirations for future functions;*
- *Activity Centre user mix – split of residents, visitors, workers and enterprises;*
- *Activity Centre vision – sets out vision for each Activity Centre to assist in formulation of further planning framework;*
- *Areas of assessment – to guide the outcomes to be encourages and avoided in the formulation of framework (amenity, diversity, activation, access, resource use and economic performance);*
- *Activity Centre goals – assigned to each area of assessment relevant for statutory assessment;*
- *Minimum standards – for development within Activity Centres to achieve vision for the Activity Centre; and*
- *Performance criteria – ideal standard of development to achieve vision for the Activity Centre."*

The above was used in the assessment of the Kardinya Activity Centre for the City's Local Planning Strategy.

City of Melville - Local Planning Strategy

The City's Local Planning Strategy (LPS) was endorsed by the WAPC on 19 January 2016. The LPS has identified that to achieve the aims of Perth and Peel @ 3.5 million, the intensification of the District Centres and use of the potential of public transport nodes and corridors is required. The LPS states that residential developments in the form of mixed use will be encouraged in line with SPP 4.2 to assist in managing/reducing the use of private transport but also encouraging the diversity of housing types in the local areas that are within the vicinity of high levels of amenity (i.e. services).

The City of Melville has six district centres within its boundaries. Many of these centres service a catchment that includes adjoining authorities. A focus of the LPS is to intensify these centres to encourage a better mix of activities including residential in order to consolidate their role as community focal points. Mixed use developments will be encouraged within Activity Centres as a way of intensifying their use. There will also be a trend to reduce the Frame areas around the Centres, which serve as a transition between the Centres and the surrounding residential areas in order to encourage a greater concentration of commercial development within the Centre whilst maintaining the residential densities within walking distance to support retail growth.

The LPS encourages transformation of district centres to fulfil their potential in terms of activity and density as per SPP 4.2. The LPS has namely highlighted these centres as places of opportunity for an increase in residential development to fulfil the in-fill targets set by the central sub-regional framework.

The LPS has also nominated properties along transit routes such as North Lake Road and South Street to be investigated for high density residential development. The LPS does not specifically identify these density targets, and it is understood this investigation into future up-coding is yet to commence to inform the preparation of this ACP. However, the ACP has acknowledged the vision of the City to provide density along these transit corridors and has reflected this vision and intent within the ACP, this will be discussed in further detail within the Urban Form section of the report.

Although the site is designated as a district centre, the City of Melville's Strategy has not identified the Kardinya Activity Centre as a 'strategic development area' within the Strategy. These Strategy areas were identified as they will likely require comprehensive strategic urban planning studies to facilitate the degree of change necessary to effectively achieve an acceptable level of urban density and land use diversity – i.e. potentially more work than that contained within an ACP.

Despite the subject Activity Centre being initially developed under a planning system that has been dominated by access for the private motor vehicle, the Kardinya Activity Centre has excellent access to existing and future public transport and has potential for expansion to facilitate anticipated levels of activity and density as specified with SPP 4.2.

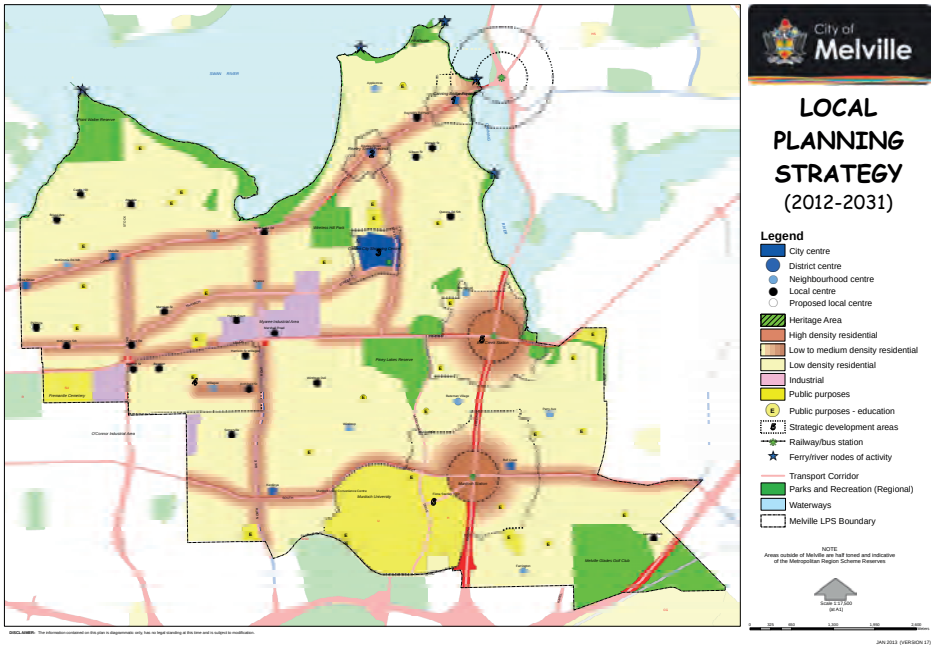


Figure 10. Local Planning Strategy – City of Melville, 2012.

City of Melville – Local Planning Scheme No. 6

LPS6 was Gazetted in May 2016 and provides the statutory planning framework for land use and development within the City of Melville. The Kardinya Activity Centre Plan area contains 'Centre' and 'Residential' zones and local reserves as shown in the figure 11 and 12. The Core and Frame of the Centre is currently zoned 'C3 – Other District Centres' under the City's LPS6 with an allocated residential density of R-AC0. Pursuant to the Scheme, the objective of the 'Centre' C3 zoning is to provide for district centre development focusing on weekly needs and services a wider district catchment for centres with no Activity Centre plan. Further objectives for the Centre zone are as follows:

- "To designate land for future development as a city centre or Activity Centre;
- To provide a basis for future detailed planning in accordance with the structure planning provisions of this Scheme or the Activity Centres State Planning Policy;
- To provide for a wide variety of active uses on street level which are compatible with residential and other non-active uses on upper levels;
- To allow for the development of a mix of varied but compatible land uses such as housing, offices, showrooms, shops, amusement centres, and eating establishments which do not generate nuisances detrimental to the amenity of the district or to the health welfare and safety of its residents;
- To ensure that development is not detrimental to the amenity of adjoining owners or residential properties in the locality; and
- To ensure the design and landscaping of development provides a high standard of safety, convenience and amenity and contributes towards a sense of place and community."

The Scheme further provides specific development provisions for the C3 zoned Centres where an ACP is not provided. However, as this ACP will provide the necessary development controls, a more appropriate zoning for the 'Core' will be C2 which has the objective:

> *"District Centres subject to Activity Centre plans: to provide for District Centre development focusing on weekly needs and services a wider district catchment giving due regard to the relevant Activity Centre plans".*

The Residential Precinct is currently zoned 'Residential' with various densities from R25 up to R80. The objectives of the Residential zone are as follows:

- "To provide for a range of housing and a choice of residential densities to meet the needs of the community;
- To facilitate and encourage high quality design, built form and streetscapes throughout residential areas;
- To provide for a range of non-residential uses, which are compatible with and complementary to residential development to promote sustainable residential development; and
- To maintain the compatibility with the general streetscape, for all new buildings in terms of scale, height, style, materials, street alignment and design of facades."

The scheme will need to be amended to reflect the proposed changes to the Centre zone to C2 and the residential density proposed in part one of this ACP accordingly.

Relevant local planning policies

There are a number of local planning policies that will continue to apply to development within the ACP area, including:

- Waste and recyclables collection for multiple dwellings, mixed use developments and non-residential developments;
- Provision of public art in development proposals;
- Energy efficiency in building design;
- Car parking and access;
- Crime prevention through environmental design of buildings;
- Amenity;
- Market uses;
- Flood and security lighting;
- Additional development exemptions;
- Non-residential development;
- Outdoor advertising and signage; and
- Residential development.

However, where there is an inconsistency between an applicable local planning policy and this ACP, this ACP shall prevail to the extent of the inconsistency.

LEGEND

- ACP Boundary
- Centre
- Residential
- Public Open Space
- Primary Regional Roads
- Other Regional Roads
- Local Distributor Road
- A1 — Additional Uses

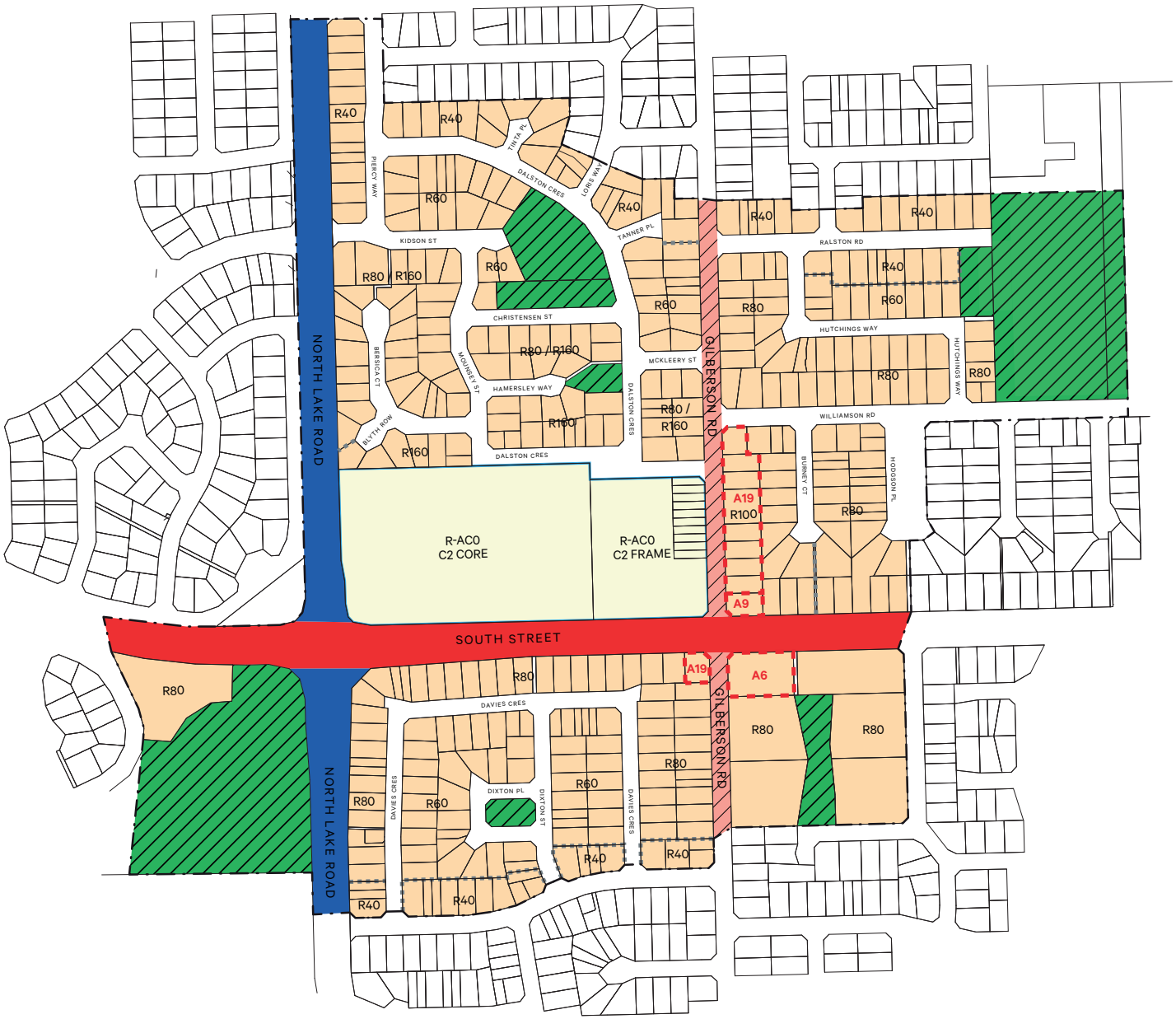


Figure 11. Proposed Scheme Zoning Map

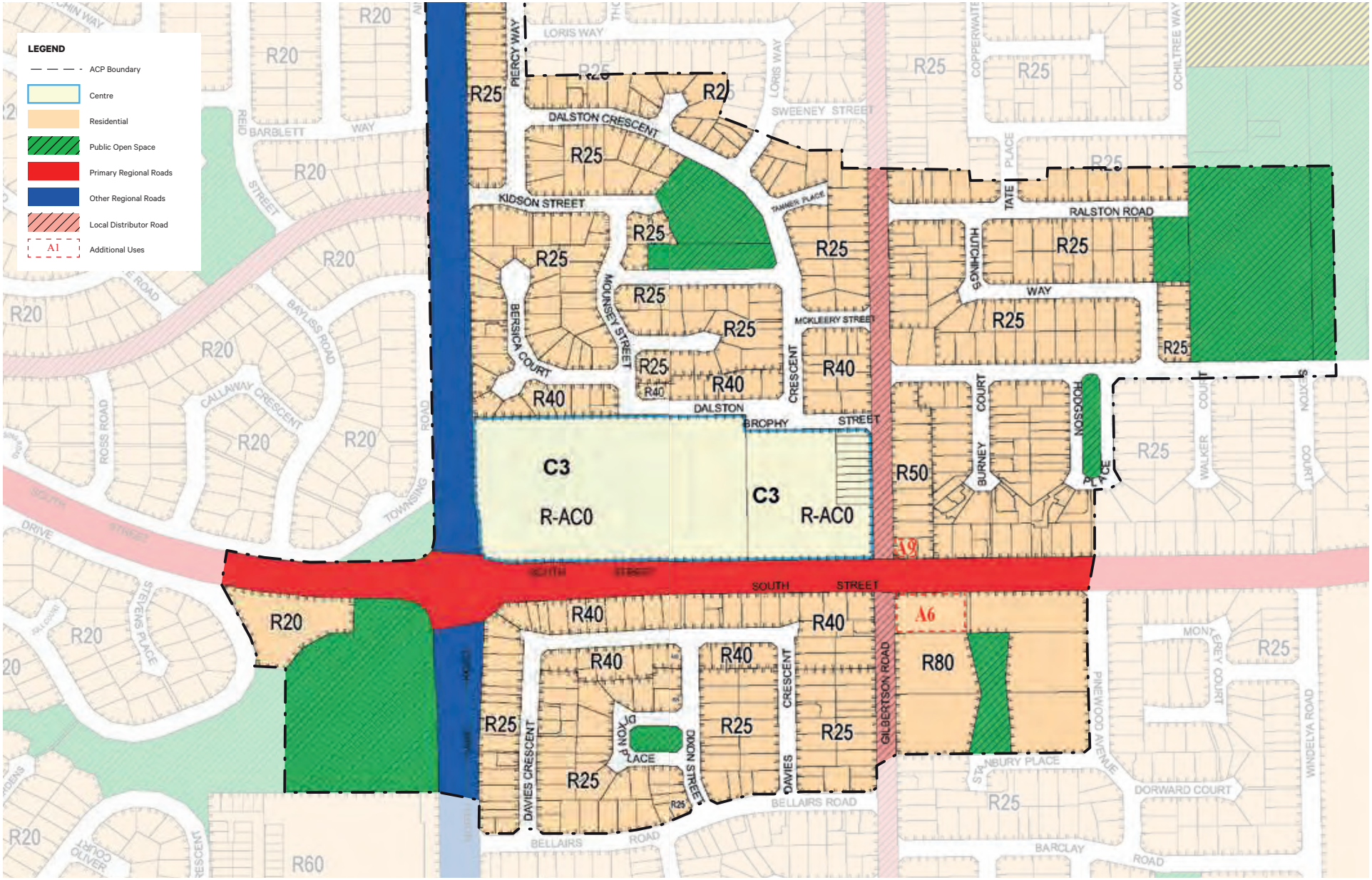


Figure 12. Current City of Melville Local Planning Scheme 6 Zoning Map

4. Centre Context

4.1 Regional and Local Context

The District Centre is generally bound by Dalston Crescent to the north, Le Souef Drive to the north-west, Galaway Crescent and Gillet Drive to the west, Bellairs Road to the south, Harry Patterson Park to the south-east, Burney Court to the east and Hutchings Way to the north-east.

The shopping centre plays an important role as a focal point for the community. The residential typology is namely single detached residential with limited grouped or multiple dwelling development present within the Activity Centre area.

The Centre is also well located within close proximity of a number of attractors such as Morris Buzacott Reserve, Alan Edwards Park, North Lake Senior High School, Kardinya Primary School, Fiona Stanley & St John of God Hospitals and Murdoch University. The Activity Centre is strategically positioned abutting two regional roads, North Lake Road running in a north-south direction and South Street running in an east-west direction which provides excellent connectivity throughout the Centre.

The Activity Centre has the opportunity to be highly connected and well-integrated within the immediate residential catchment as well to the broader regional network, with high frequency bus routes operating along South Street and Gilbertson Road, regional roads servicing the Centre and pedestrian corridors throughout adjoining residential areas. Currently the Core of the Centre has not been designed to optimise this opportunity with poor pedestrian linkages, customer difficultly with access and egress and a lack of recognition the existing site has for existing bus routes that operate along South Street.

4.2 Infrastructure

The ACP seeks to promote more efficient use of public infrastructure and existing local amenity (local and commercial) to achieve a more sustainable urban environment. The service capacity of existing infrastructure to accommodate proposed infill development within the next 30 years has been taken into consideration when planning for the future of the area.

Assessing the implications of the in-fill being provided in the context of the existing infrastructure provision allows for more certainty to servicing agencies in respect to forward planning and the allocation of funding and resources. Pritchard Francis civil engineering consultants have provided an engineering services report of the existing civil infrastructure services within the locality and the capacity of this infrastructure to cater for 1,875 dwellings.

Projection as proposed within the ACP. It should be noted, Prichard Francis conducted their servicing investigation based on 1,856 dwellings, however, upon the amendments to the ACP boundary following feedback from DPLH, an increase in 19 dwellings is projected. Given the minor increase, confirmation from Pritchard Francis confirmed the change in dwellings would not impact the servicing advice from providers, given the level of capacity within the area. Refer to Appendix 3 for servicing report.

Table 10 – Servicing Summary

Sewerage reticulation
• The reticulation infrastructure in the catchment of the subject area can cater for the increased predicted flows; • The Le Suoef Drive pump station that serves the catchment and some down-steam headworks will need to be upgraded in the future; and • In regard to developers requirements as per above there should be no upgrading of reticulation infrastructure, but developers may be required to fund new, relations and/or protection of works depending on the development proposal taking place. The upgrading of the headworks infrastructure will be funded by Water Corporation.
Water reticulation
• Water reticulation does not seem to be a problem. A hydraulic consultant will be required to asses each individual development site in order to size the water and fire connections and review the water pressure and flow within the existing water mains to verify whether pumps and tanks are necessary to support a proposed development.
City of Melville Drainage Infrastructure
• An upgrade to the existing road reserve drainage networks should not be required, and all stormwater networks are appropriately sized to cater for the existing land uses and road reserve widths. An increase to the residential zoning will not impose additional load on the existing stormwater networks.
Gas Supply
• The existing and planned upgrades to gas infrastructure within the Activity Centre plan area will sufficiently accommodate the proposed density increases.
Electrical supply
• The additional load that will be added to the network will be approximately 6.5MVA of design load. Network feeders are designed to cater for 10MVA of actual load and some provision for growth. • In the past when additional load is added to the network at a slower rate, approximately 1.5MWA per year (i.e. in-fill growth), this has been considered load growth and thus any major network reinforcement works that may be required to provide the capacity in the area is covered by Western Power. Based on the overall load profile and probability of a staged in-fill uptake in the area, large network upgrade costs would not be incurred.
Communications
• Kardinya has already been connected to NBN Co broadband under the Brownfields rollout with Fibre to the Node technology; • Developers have two obligations to provide fibre ready pit and pipe and to provide telecommunications infrastructure as is provided for other utilities, for new developments; • Assuming a mix of development by multiple homeowners and land developers the probability of Fibre to the Premises being delivered would increase with decision made on a commercial basis; • South street, North Lake road and Gilbertson Road are well services with large conduit routes, however other local streets are not regarded as fibre ready and cannot support a substantial increase in in cable infrastructure with some streets having asbestos in the telecommunications conduit infrastructure (which will increase costs associated with upgrade. Assuming road reserve are unchanged, telecommunication infrastructure is unlikely to require relocation from redevelopment.

Figure 13. Regional Context

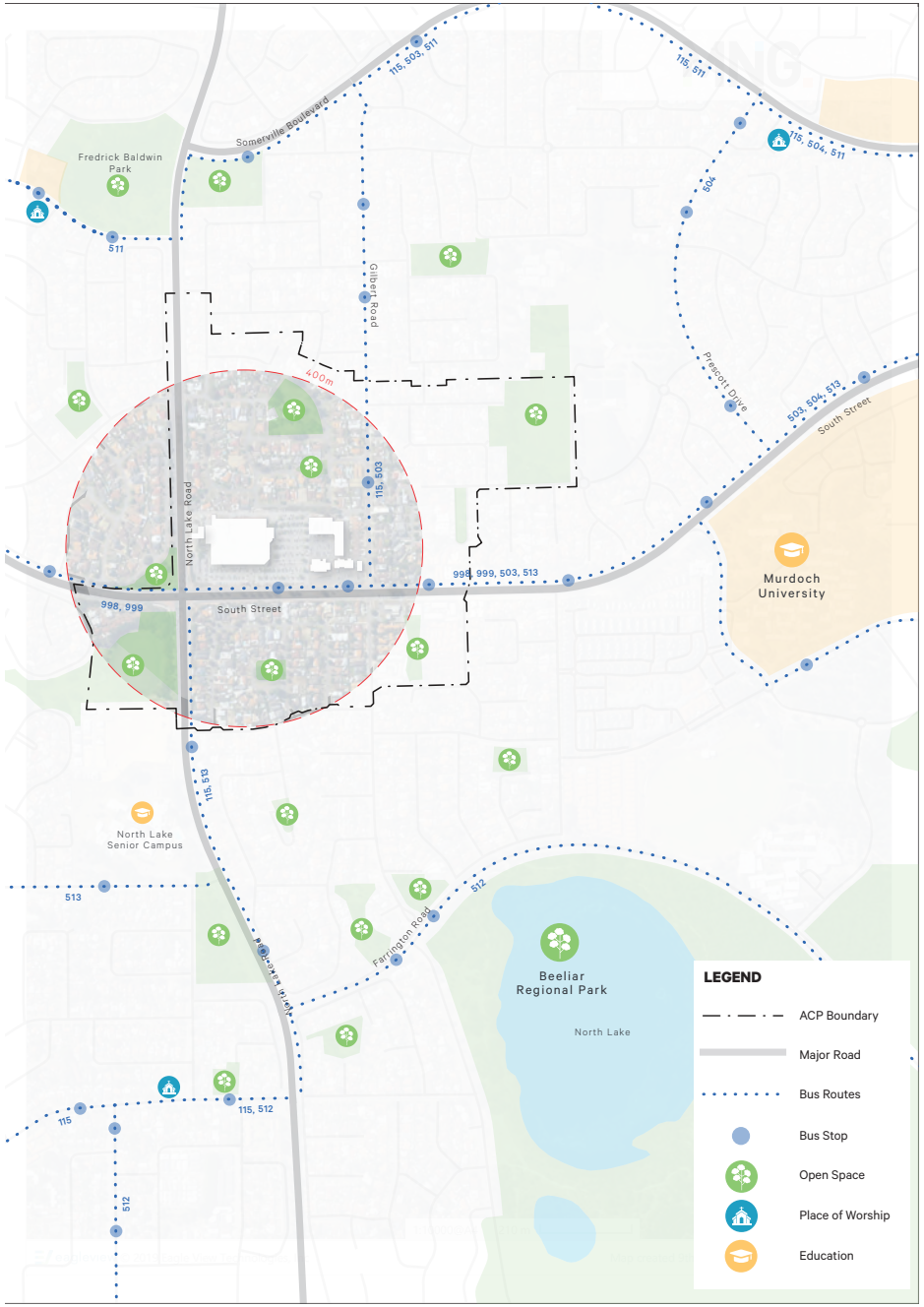


Figure 14. Local Context

Biodiversity and Natural Area Assets

The subject area is an existing urban area. Biodiversity and native habitat are limited to four local reserves, street trees and private gardens which contain a variety of introduced and native species. There are no sites within the subject area that are classified as geomorphic wetlands or bush forever sites.

Acid Sulphate Soils

A desktop search using Department of Water and Environmental Regulation Acid Sulphate Soils online mapping system has determined that there are no medium or high-risk Acid Sulphate Soils within the ACP area.

Site Contamination

A desktop search using Department of Water and Environmental Regulation (DWER) online mapping system has determined that there are no registered contaminated sites within the ACP area. There may be some sites which are contaminated but not listed. If contamination is found, it is required to be reported to DWER.

Heritage

There are no Aboriginal or European State or Local heritage listed buildings or sites within the subject area.

Bushfire hazard

There are no bushfire prone areas as defined by Department of Fire and Emergency Services in the subject area.

Topography

The ACP area has a general fall from the south-west to the north with the north-west precinct having the steepest of falls. The western extent of the precinct has an RL of 49m AHD and the northern extent of the precinct has an RL of 10m AHD to demonstrate the level difference across the area.

Individual sites will need to address the slope across properties in new developments to appropriately manage stormwater and create useable spaces without compromising the streetscape and neighbouring property amenity through the use of extensive retaining.

Groundwater

The ACP area typically consists of sandy soils suitable for urban development due to high permeability and easy ability for excavation.

The Department of Water and Environmental Regulation indicate that the groundwater is likely to be encountered at RL 9.0m AHD in the eastern precinct and reduce down to RL 6.0m AHD in the western precinct of the ACP area. As most of the ACP area is above 10m AHD, the groundwater level will not impact the structural design or stormwater detention solution for these areas.

In the northern precinct, basement structures and stormwater detention will likely be difficult due to the small difference between the ground level and the groundwater level. This will likely manifest in car parking being provided at ground and in mezzanine levels for new developments unless more expensive water proofing and potential pumping of basements is proposed. Concealment of any at-ground or above ground car parking areas is mandated in the R-Codes for apartment and mixed use developments which will ensure good design outcomes will still be required from the outset.

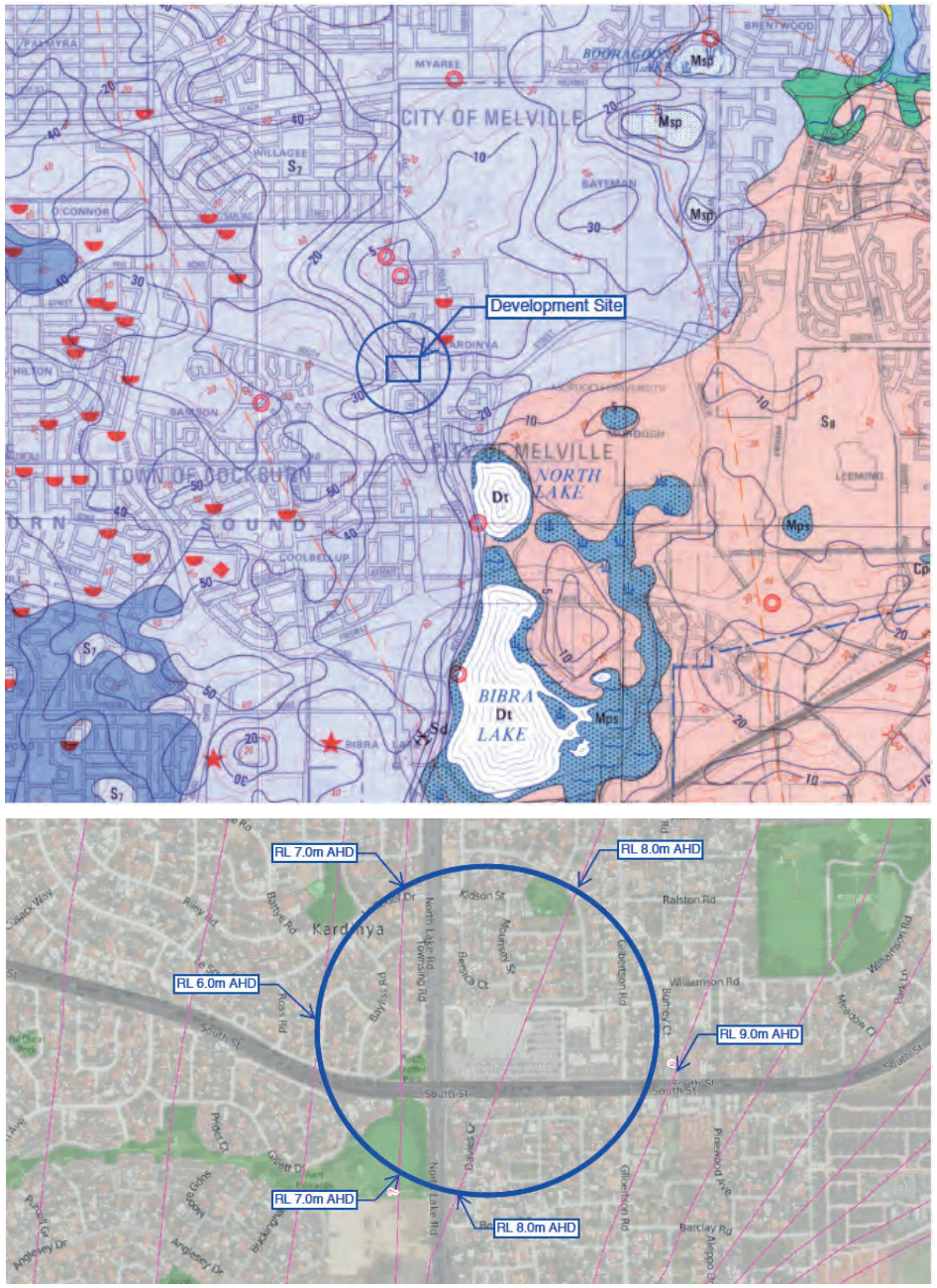


Figure 15. Ground Water Map

5. Movement

5.1 Regional perspective

Kardinya Activity Centre is a well-connected centre from a regional perspective. The site is connected by two regional roads, high frequency bus routes servicing the centre, and the external pedestrian movement throughout the area has opportunities for improvement to make the centre more pedestrian oriented. The movement analysis identifies existing site conditions, traffic generation and distribution, vehicle and pedestrian access points movement, key public transport routes as well as cycling conditions. The Kardinya District Centre is highly accessible with multiple regional roads surrounding the centre and proposed activity centre boundary. The road category can be summarised in the below table:

Table 11: Road Hierarchy

Street Name	MFRH Category (Metropolitan Functional Road Hierarchy)
South Street	Primary Distributor
North Lake Road	Distributor A
Le Souef Drive	Local Distributor
Gilbertson Road	Local Distributor
Petterson Avenue	Local Distributor
Other Roads	Access Road

South Street is a Primary Regional Road Reservation which provides a substantial amount of traffic flow between Fremantle, Kwinana Freeway and the Canning Vale Industrial Area to the east. The road is controlled by Main Roads and has a speed limit of 70km/h and primarily serves traffic movement from an east to west direction, Canning Vale to Fremantle. South Street is designated as "High Priority Public Transport Corridor" and a "Bus Rapid Transit or Light Rail beyond 3.5 million". This would be a 'step up' from High Frequency Public Transport Corridor and suggests that measures such as signal for bus priority, dedicated peak hour bus lanes or bus queue jumps could be employed, or light rail infrastructure being implemented in the future to provide better connections between Fremantle and Murdoch activity centres. North Lake Road is an 'Other Regional Road' reservation and provides for some of the freight traffic from Fremantle to the north of the activity centre site as well as a medium to high portion of general traffic in the locality (with a District Distributor 'A' designation in the road hierarchy). The speed limit for North Lake Road is 70km/h and is the predominant connection from Cockburn Central to Alfred Cove, also servicing the Bibra Lake industrial area as well as Myaree commercial area positioned along Leach Highway.

From a Regional Planning Perspective, the Department of Transport released the Perth Transport Plan for 3.5 million and Beyond in August 2016. Transport @ 3.5 Million is modelled on the WAPC's draft Perth and Peel @ 3.5 Million planning frameworks of where people will live and work. Transport @ 3.5 Million provides a long-term plan to guide development of a strategic, sustainable and robust transport network for Perth and Peel. It describes a future transport network that provides people with more than one viable option for travelling to work, school and shops and for accessing services and recreational activities. The vision for Perth's transport network is to meet the following objectives:

- Optimise use of the existing network and as it grows;
- Integrate with land use and across the public transport, active transport and road networks;
- Deliver high frequency, 'turn up and go' mass rapid transit connected with effective public transport feeder services;
- Provide a safe, connected active transport network of primarily off-road cycleways and walkways; and
- Maintain a free-flowing freeway and arterial road network for the efficient distribution of people and freight.

The plan will guide future investment, planning and policy decisions for the metropolitan transport system, as well as inform local government planning, industry, developers and the community.

Refer to Appendix 2 – Transport Impact Assessment, Cardno

Figure 16. ACP Movement Map

5.2 Public Transport

There are five bus services that operate along South Street and Gilbertson Road. Currently, there are three bus stops located along South Street, two stops that are directly positioned outside the front of the Kardinya Park Shopping Centre, and a third located on the opposite side of South Street. The bus Routes 115, 513 and circle Route 999/998 all operate along South Street. Route 115 operates from Elizabeth Quay Bus Station and finishes at Hamilton Hill, Route 513 services Murdoch Station through to Fremantle and the circular Route 999/998 services the inner-metro area of Perth, completing a clockwise bus service, as far south as Murdoch and as far north as Stirling. All three of these services are considered high frequency bus routes during Monday to Friday. There is a fifth bus service Route 503 which predominantly services Murdoch Station to Bull Creek Station, this service is more infrequent being a more localised bus service. A summary of the bus service frequency is provided below:

Table 12: Bus Services Frequency

Route	Weekday Peak	Weekday Off Peak	Weekend
999	5 – 10 mins	15 mins	15 – 30 mins
998	5 – 10 mins	15 mins	15 – 30 mins
115	15 mins	20 – 30 mins	30 mins
503	10 – 15 mins	20 – 40 mins	N/A
513	15 mins	20 – 30 mins	60 mins

The transport impact statement prepared by Cardno provides a list of short, medium and long term strategies to help improve the public transport services for Kardinya. These modifications will be summarised in detail at the end of the Movement Section.

5.3 Pedestrian Movement

As Kardinya's population grows within the ACP area, there will be more emphasis on providing high - quality and safe pedestrian and cycling infrastructure to encourage greater shift's to these modes of transportation as well as accessing public transport.

The Activity Centre is divided by a number of sections by South Street, North Lake Road and Gilbertson Road creating both physical and psychological barriers (i.e. deemed too difficult to cross). There are two sets of traffic lights along South Street at the intersections with Gilbertson Road and North Lake Road.

Crossing South Street and North Lake Road is currently not inviting for pedestrians as there is significant priority for vehicles and a high-speed environment (70kmp/h). The surrounding residential areas have five (5) pedestrian access walkways (PAWs) that provide pedestrians access along Major Road throughout the Centre. Although these PAWs improve the pedestrian connectivity, these pedestrian accessways are not inviting in nature (see images below).


Brophy Street to Dalston Crescent – Facing North


Dalston Crescent to Brophy Street – Facing South


South Street to Davies Road PAW – Facing South

Along North Lake Road, South Street and Gilbertson Road footpath's have been provided with adequate width and condition. However, existing bus stops along South Street and Gilbertson Road often require public transport commuters to walk across intersections and into environments that are car dominated with no pedestrian right of way, which is unsafe and not convenient for commuters.

The pedestrian experience is very poor in local streets with a lack of footpaths provided throughout the locality. This along with a lack of shade from street trees or building interface pacifies pedestrian movement throughout the ACP area. The pedestrian experience is proposed to be improved by the future redevelopment of the Kardinya Park Shopping Centre through improvements in pedestrian connections to existing footpaths in the area, bringing the building to the edges of the site to remove the need for pedestrians to walk through car parking areas and removal of topographical constraints through new buildings fitting into the existing topography.

There is also a new main street proposed as part of the shopping centre development between the Centre zone (Lot 17) and the Frame (Lot 31) which will provide further pedestrian connections in a north-south direction through the very centre of activity. Further improvements such as additional east-west connections through the Frame will further enhance the pedestrian access and experience through these areas.

The local road network could be vastly improved with the provision of footpaths. Additionally, both major roads and local road network could benefit from additional shade being provided. These improvements would create pedestrian activity, access and amenity to promote walking as a form of transport and decrease the reliance on private vehicles. To achieve this, the ACP has proposed two key provisions for future infill development to be required to contribute and/or provide. The first provision pertains to footpaths. Footpaths within the local road reserves are extremely limited. The expectation is that at least one side of the road reserve is provided with a pedestrian footpath. In order for this to be achieved, and furthermore coordinated, the ACP is proposing for the applicant to provide a contribution relative to the length of the lot frontage, at half the cost determined by the City. Half the cost has been applied, to ensure that the first developers are not penalised to pay the full cost for one footpath. By requiring half the contribution shares the cost between both sides of the street. The second provision is street trees. Requiring the developer to plant a street tree within the verge is essential to contributing to improving the overall tree canopy of the area. Applicants will be required to maintain the street tree for a period of two years to the satisfaction of the City. Both of these provisions will greatly assist in improving the pedestrian amenity of the area.

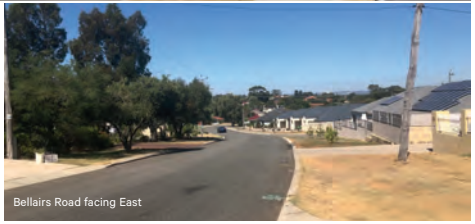
Larger infrastructure contributions such as underground power, street lighting etc. could be implemented via the council adopting a special area rating. This would provide a suitable mechanism to deliver these improvements whilst engaging with the community to facilitate these upgrades.


South Street Footpath – Southern side facing West


North Lake Road footpath – eastern side facing South


Gilbertson Road footpath and intersection with South Street – western side facing South


Cameron Way facing South


Bellairs Road facing East

5.4 Cycling

The surrounding road network has predominantly been designed for high volumes of cars and freight vehicles with little to no provision being made for cycling. Whilst the existing footpaths are wide enough for cycling and pedestrians to move cohesively, there is no safe opportunities for cyclists to ride without having conflict with pedestrians / vehicles. There are also multiple path deviations particularly along South Street that require cyclists to give way to cars. This is not ideal, given the volume of traffic along South Street. The Centre itself provides little opportunity for both staff and customers to cycle to the Centre with a lack of cycling infrastructure to support this mode of transport. Bicycle storage is rare with the Centre providing a lack of end of trip facilities.

The cycling and walking network plan provided as part of the Perth and Peel @ 3.5 million Transport Plan shows on-road cycling route improvements along both South Street and off-road improvements along North Lake Road. Due to both of these roads being regional roads, the implementation of these upgrades will require State and local government implementation due to the management/hierarchy of these roads. This plan is also consistent with the City of Melville's Bike Plan 2012. All other cycling paths within the Activity Centre plan area are on-road with low traffic speeds generally preventing conflicts with vehicles. All new developments will be required to provide end of trip facilities and bicycle storage/parking as mandated within existing local planning policy. This will further encourage greater cycling patronage within as well as to and from the ACP area.

5.5 Vehicle Movement – Centre

The current vehicle movement within the Centre Core and Frame can be summarised as being convoluted and in some instances dangerous for both vehicles and pedestrians. A summary of the current vehicle access points can be provided below:

Table 13: Vehicle Access and Egress

Street Reference	Reference	Details of Access / Egress Point	Proposed / Suggested Modifications
North Lake Road	**Access 1**	Left and Right turn access point from North Lake Road. Currently is largely used by service vehicles gaining access to the one-way laneway that runs across the rear of Kardinya Park Shopping Centre. The access point is also used for access to service station. Vehicles can access the car park of the Centre from this point, however, is restricted by the design of service station.	• Proposed to remain and be utilised in a similar manner as currently seen with some slight modifications to improve its functionality. • Re-design the service station and convenience store, to improve safety for customers wanting to access / exit the Centre directly from North Lake Road. • Provide improved two-access access and a clearer segregation for service vehicles and customers.
	Access 2	Right in, left out from North Lake Road. Currently a slip lane is provided along North Lake Road for vehicles turning right. Predominantly used for access to the service station also.	• Proposed to be relocated further away from Access Point 1 to be a left out only onto North Lake Road. This will further assist with the vehicle circulation.
	Access 3	Left out onto North Lake Road. Predominantly utilised for customers coming out of the shopping centre and service station.	• Remove this access point completely. Access 2 will proposed to service the same function as Access 2 currently does. Rationalise this egress point will provide a safer vehicle environment.
South Street	**Access 4**	Left in via a slip lane and right out onto South Street. Currently this access point is the key entry into the main car parking area. Vehicle movement from this ramp can be congested during peak periods, given the run into the car park does not provide enough distance for vehicles to turn left or right once entering the Centre. This can have impacts to queuing to South Street.	• Major changes proposed to Access 4. Access 4 is to be moved further down South Street to avoid banking to the South Street and North Lake Road. • Redesign the ramp to ensure an at-grade entry and egress point. • Extend the slip lane to ensure there is a greater de-acceleration lane for entry into the Centre.
	Access 5	Left in and right in from South Street into ROW. Left out and right in from South Street from ROW also permitted. This access point currently provides a range of vehicle movements, which provides the most flexibility into and out of both the Core and Frame.	• This access point will largely remain consistent with its current operation. Some slight modifications are proposed to improve pedestrian crossing points e.g. pedestrian and pram islands and pedestrian zebra crossing is proposed.
South Street (cont)	**Access 6**	Left in from South Street and right out onto South Street. Provides direct vehicle access into the frame site.	• The crossover Lot 17 from South Street has no slip lane for deceleration and has the potential to be impeded by buses stopping at the existing bus stop. Given the infrequency of use and that it is clearly visible whether the crossover is impeded whereby vehicles can readily access the main street access, no change is proposed to this crossover treatment. • It is also noted that the right turn crossover movement from Lot 17 to Gilbertson Road has the potential to impeded during peak times by queues from the Gilbertson Road / South Street lights. Given the highly functioning nature and accessibility to Brophy Street, no change is proposed to this crossover treatment.
Gilbertson Road	**Access 7**	Two way vehicle movement currently permitted. Both left and right in and out movements are permitted. Provides a secondary access point for the Frame.	• The ACP is proposing to impose an easement in-gross within this east-west connection. The intent of this is to emphasise the importance of this east-west connection throughout the site, as well as create a greater internal road that encourages improved pedestrian movement. In this regard, a 7.5 metre easement in-gross is proposed. It is suggested upon any major development being proposed, that the City has the nexus to impose this easement in-gross to ensure a pedestrian footpath is provided.
	Access 8	Two way access road that provides direct connection to the 'main street' and furthermore acts as connection point to both the Core and Frame. Vehicle access allows direct movement both left and right movements onto Gilbertson Road.	• There are no proposed changes or suggested modifications proposed to the Brophy Street access point. Future signage is intended to be placed in this location to increase the relevance of this access leg, as currently it is underutilised as it provides essential secondary access to the Centre.

Figure 17. Access Reference Map

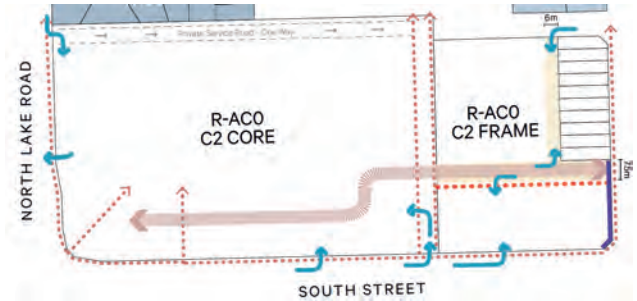


Figure 18. ACP Centre Movement Map

5.6 Parking

Most of the car parking in the area is provided on private land and is therefore the responsibility of landowners and businesses. New development proposals will generally need to comply with the City's local planning policy – car parking and access with these individual developments to ensure that should a shortfall of off-street car parking be proposed there is minimal to no impact outside of the property where the development is proposed. Local road on-street car parking is currently not common/ widespread in the ACP area and therefore car parking restrictions are not in place within these streets – only on major roads to ensure the flow of traffic is maintained. Should car parking be foreshadowed as a problem for a development or a wider issue in the locality, there are a number of methods to address this issue outside of the controls of an ACP. The methods include:

- Requirement of a parking management plan with development applications/approvals to place responsibility for management and enforcement on the developments responsible for potential conflicts become a problem in the locality;
- Provision of on-street car parking restrictions to limit the time in which vehicles can be parked in the locality and areas in which cars can be parked; and
- Provision of parking within the verge areas to provide additional car parking which does not conflict with the flow of traffic. The verge widths of the local roads are approximately 5m and hence are wide enough to provide on-street car parking should the need arise in the future (1.5m footpath and 3m embayment widths).

In terms of overall car parking provision, as the need for parking intensifies and becomes more expensive in the short term, time limited managed parking throughout the locality both off-street and on-street will encourage rationalisation of car trips within as well as to and from the Centre and also encourages a greater use of walking, cycling and public transportation modes of transport.

The TIA prepared by Cardno determined that an applied rate of 5.2 bays per 100sqm for the Centre would be deemed appropriate based on an applied peak period. Therefore as suggest above, internal car parking management would be necessary through a car parking management plan to regulate parking demand within the Core and Frame. Encouraging travel behaviour change by a Travel Smart Plan would also be necessary as reducing full time staff accessing the Centre via private vehicle puts an additional unnecessary demand on the current parking supply.

5.7 Traffic Analysis

The TIA prepared by Cardno, has prepared a detailed traffic project analysis of the signalised intersection performance based on the projected growth within the ACP. A summary of the findings is provided within the table below:

Table 14: Intersection Performance Summary

Intersection	Summary of key Findings and Results	Suggested Modifications and ACP Response
North Lake Road / Access 1	• Overall the intersection performs at a high standard. • Minor delay for the right turn out movement on the existing intersection layout, results in only minor queuing and no impact on the broader network. • However due to the signalised intersection at South Street/North Lake Road, it is expected to perform better than modelled.	The TIA suggests no changes to be made.
South Street and North Lake Road	• The analysis demonstrates there is some deterioration of this intersection during peak periods for the 2031 scenario and the ultimate development scenario. • It is to be noted however, the background traffic projections alone, withstanding the increase in density projected is likely to deteriorate regardless. Therefore, providing density will assist in greater use of public transport demand which will result in a marginal impact on the intersection performance.	The TIA suggests no changes to be made.
South Street / 'Main Street'	• The analysis concludes that the 2031 scenario and the ultimate development projection results in an unsatisfactory performance for this intersection. • However given the substantial changes proposed within the redevelopment plans of Kardinya Park, traffic disruption will be more evenly spread between the 8 access points. Therefore, during 'peak periods' customers will have other means to access the Centre.	The TIA suggests no changes to be made.
South Street / Gilbertson Road	• The analysis concludes that the intersection performance may deteriorate due to the increase in regional traffic. • The TIA projects that the upgraded intersection proposed, may result in further delays, however this could be improved by modifying the signal phasing as demonstrated. • The TIA also concludes that given the predicted lower car dependency the trip generation rate will likely decrease, improving the performance of this intersection. A potential decrease in 60% could occur per household.	• Gilbertson Road will require potential road widening. Part 1 of the ACP has developed provisions for the lots that are affected by this potential land take to compensate landowners affected by this. • Modified signal phasing has also been suggested to be investigated to further improve the performance of this intersection moving towards 2031 and the ultimate development scenario.
Gilbertson Road / Brophy Street	Intersection is expected to perform satisfactorily.	The TIA suggests no changes to be made.
Gilbertson Road / Williamson Road	Intersection is expected to perform satisfactorily.	The TIA suggests no changes to be made.
South Street / Petterson Avenue	• The increase in density would lead to around 30 additional trips in the peak hour. • This increase would likely be less than 10% if existing traffic volumes on Gillett Drive and Petterson Avenue. In accordance with the WAPC Transport Assessment Guidelines, this does not require a separate assessment. • The TIA has accounted for this increase in the South Street background traffic growth for the intersections modelled.	No suggested changes.

5.8 Activity Centre Plan Response – Movement

The ACP aims to reinforce a hierarchy of street networks; upgrades to facilitate better prioritisation of pedestrian and cycle movements and over time devoting less space to private vehicle movements and reduce the visibility of car parking. The following ACP responses are propos

The ACP recommends that ongoing liaison should be had between the City of Melville, Public Transport Authority, Main Roads WA and Department of Transport to implement infrastructure and related initiatives.

Table 15: Movement Implementation

Action	Response	Stakeholder
• Increasing density and mixed-use development in close proximity to the Core and Frame, will encourage walking and cycling within the Kardinya Activity Centre.	This is a medium to longer term projection and is one that requires many stakeholders to deliver. It is essential that sound, well-designed development outcomes are supported by the determining authorities, to achieve the density targets within SPP 4.2.	All
• The 'Core' and 'Frame' shall improve and implement the following infrastructure as the Core and Frame undergo redevelopment: – Creating of two vibrant main street environments. – Enhance pedestrian linkages and accessibility into the Centre. – Provide adequate end-of-trip facilities consistent with the City's local planning policies. – Provide a built-form that encourages safe pedestrian movement and activity. – Implement Travel Smart Plans to aim to reduce car dependency. – Enhance vehicle access and egress both around and within the District Centre. – Improve way finding signage.	This is a short-medium term goal for the site. These principles have shaped the Development Application for the redevelopment of the 'Core' and have provided the foundation for the Frame to replicate. This ACP will greatly assist the City and determining authorities, in providing the mechanism to implement these principles when the Frame redevelops into the future.	Landholders, Local Government, WAPC
Improve the public realm by providing improved footpaths and shade trees.	This a short-medium term goal. The ACP will provide the mechanism to improve the public realm environment as infill development occurs within the ACP.	Landholders, Local Government and WAPC.
Investigate improved public transport service options which include: • Increase in bus frequencies for routes 512 and 115; • Provide safer and more convenient bus shelters/stops. • Investigate a rapid bus route along South Street.	As density increases within Kardinya, the demand for public transport will increase, as well as the reduction of private car usage. In this regard, providing for improved bus services particularly along South Street will be required to be investigated, as the area develops.	Public Transport Authority, Landholders, City of Melville.
Potential road widening for Gilbertson Road to improve intersection performance and modify signal phasing for Gilbertson Road / South Street.	As detailed within the TIA prepared, road widening of the intersection of Gilbertson Road, South Street is required to improve intersection performance. Furthermore, modified traffic signaling as suggested within the TIA should also be investigated.	Main Roads City of Melville

6. Activity

The current performance of City of Melville Activity Centres was assessed in the Local Planning Strategy using a scoring system out of 10 as recommended within the Local Commercial and Activity Centres Strategy (LCACS 2013). This provides an understanding of the current potential for activity within centres and provides a framework to develop future expectations for Activity Centre performance. Kardinya District Activity Centre's economic sustainability performance shows the most obvious weakness is in the intensity of both low residential density and number of jobs. Kardinya has the lowest jobs per hectare of the City of Melville district centres with a score of 3.1 out of 10. In terms of residential density, it performs relatively poorly with a score of 3.0 out of 10.

As stated within the Strategy, Kardinya scored relatively poorly in the mixed-use category with 6.5, indicating that retail is the dominant employment type of the Centre. Similarly, the equitability index at 7.0 is consistent with what would be expected of a mid-sized shopping mall, with limited employment outside of retail, cafes and other food outlets. Both the Intensity and Diversity scores indicate that a greater level of residential density is required to be provided to improve the performance of the District Centre in its role with the Activity Centre hierarchy.

Kardinya's overall score for employment was 4.3. Kardinya has the lowest total amount of jobs of all the District Centres in the City of Melville with a total count of approximately 900 jobs within the Centre. Employment quality was relatively low with 12% strategic employment, equating to a score of 6.5. The shopping centre redevelopment will assist in provision of a number of additional jobs but also the diversity of the jobs provided with a range of additional non-retail uses proposed as part of the redevelopment.

By way of comparison, the Booragoon Secondary Centre has a score of 5.3, Bull Creek has a score of 5.1, Petra Street has a score of 4.8 and Melville has a score of 4.3. This indicates that the Centre is not performing well within the hierarchy with the ACP well placed to deliver improvements in these key areas through increases to residential density, diversification in employment offering and the on-flow effects to the promotion of transport infrastructure provision (see above movement section).

Table 16: Kardinya current performance, Source: Pracys 2013.

Principle	Metric	Metric Score	Total Score
Intensity	Residential Density	3.0	2.0
	Jobs per Hectare	1.0	
Diversity	Mixed Use	6.5	6.8
	Equitability Index	7.0	
Employment	Quantum	2.0	4.3
	Quality	6.5	
Accessibility	Distance from CBD (kms)	4.5	4.3
	Transport infrastructure	4.0	

The ACP identifies three sub-areas being a 'Core', 'Frame' and 'Residential' Precincts. The Core is intended to provide the largest supply of retail floor space, and commercial land uses that will predominantly service the daily and weekly needs of the community.

The Frame is intended to facilitate predominantly providing more specialised commercial spaces, whilst providing a high-density residential development to support the retail offerings within the Core precinct.

The Residential Precinct will provide a range of dwelling types. The density indicated has been aligned to the requirements of SPP 4.2 for a District Centre targeting 30 dwellings per hectare within a 400-metre catchment.

As the zoning of the Core and Frame will need to change to 'C2 – Centre Zone' under LPS6 to reflect the ACP over the area, there is a requirement to assign the land use permissibility within the ACP. A review of the City's Local Planning Scheme zone table shows many of the existing and likely future land uses as either P, D or A land uses within the Centre C3 zone and are appropriate and hence this ACP will adopt land use permissibility's of the C3 zone for the Core and Frame of the ACP.

There is an existing restrictive covenant in place over Lot 17 (Core Precinct) which has the purpose of limiting land use on this lot. This is an outdated methodology to control land uses with modern planning using a Local Planning Scheme to control the permitted and non-permitted land uses within the scheme area. To facilitate the extinguishment of restrictive covenants within the ACP a local planning Scheme Amendment is required as set out within WAPC Planning Bulletin 91/2017. This means that when the Scheme is amended to reflect the new zonings and densities proposed, the restrictive covenant is proposed to be extinguished to ensure that only the Local Planning Scheme controls the land use within the ACP.

6.1 Land Uses Diversity

Kardinya is designated as a District Centre under SPP 4.2 Activity Centres hierarchy. District Centres are fourth highest in the hierarchy, playing an important role providing the daily and weekly needs of residents within the catchment. The hierarchy allocates different levels of community needs, employment growth and a diversity of goods and services to measure the importance of Activity Centres, and its role in servicing the local community. The table below summaries the District Centre performance targets in accordance with SPP 4.2.

Table 17: SPP 4.2: District Centre Targets

Area of Focus	District Centre Targets
Service Population	20,000 – 50,000 people
Walkable Catchment	400 metres
Transport connectivity and accessibility	Bus network
Typical retail development	Discount Department Stores Supermarkets Convenience goods Small scale comparison shopping Personal services Some Speciality shops
Typical office development	District level office development, local professional services
Residential density target (gross ha)	20 (minimum) 30 (ideal)
Diversity performance target – mix of land uses (centre size – shop-retail floor space component)	Above 100,000m^2 – 50% 50,000m^2 – 100,000m^2 – 40% 20,000m^2 – 50,000m^2 – 30%. 10,000m^2 – 20,000m^2 – 20% Less than 10,000m^2 – N/A

Residential Land Use Profile

Currently, the layout of Kardinya maintains a very traditional suburban layout, consisting of a box shopping centre with a small array of speciality tenancies, surrounded by low density housing. The current dwelling per hectare of Kardinya is severely underperforming, when assessed against the criteria of SPP 4.2, at approximately 9.4 dwellings per hectare within a 400m walkable catchment. The surrounding residential profile has seen slight density increases with the gazettal of LPS6 in 2016, with properties located in close proximity to South Street being rezoned to R50. However, the residential character, notwithstanding this density increase has remained as a similar dwelling typology for the majority of the surrounds of the District Centre.

There was however an exception to the dwelling profile, which can be defined by the residential catchment to the west of North Lake Road. This residential profile was extensively different to the housing profile south of South Street, and within the immediate surrounds of the District Centre. Block sizes were generally at a minimum 200m^2 larger on average, housing stock appeared to be much more modern, whether this be via renovation or demolish and rebuilds and the general road layouts and varying topography, provided an additional constraint to redevelopment potential.

In this regard this residential area west of North Lake Road was excluded from being included within the ACP. The remainder of the residential profile clustered, south of South Street and north and east of Kardinya District Centre, maintained a much greater housing profile consistency, providing the ability for the residential area to be grouped into one precinct, rather than being segregated based on built-form or historical profiles. A streetscape audit east of the District Centre has been undertaken within the Urban Form section of this report to outline how and why the ACP boundary was defined as submitted. There are distinctive housing profile changes as the distance from Kardinya District Centre expands. This is discussed further below.

Centre Land Use Profile

The existing District Centre is limited in the diversity in land uses that are provided. This limited diversity of selection and activity has been a key concern from local residents and was raised frequently during the community consultation period. Kardinya Park Shopping Centre is the clear focal point and heart of the District Centre, providing an array of anchor tenancies such as Coles and K-Mart, whilst also providing multiple smaller speciality tenancies. The redevelopment of Kardinya Park Shopping Centre is an effort to address this concern and proposes a multitude of land uses such as health and wellness and entertainment uses to appeal to a wider demographic.

Aside from ALDI the adjacent centre mostly consists of smaller office spaces, consulting rooms, retail and eateries. With the projected density growth within the next 30 years, there remains adequate retail capacity in addition to the proposed retail growth within the DA for the adjacent site to expand. Whilst it is not projected for the adjacent lot to accommodate the level of retail floor space Kardinya Park Shopping Centre generates, it is expected smaller retail and non-retail based tenancies will be provided to meet the vision of a mixed-use District Centre. This has been the key intent behind segregating the Core and Frame within the Centre. The table below summarises the projected retail and non-retail growth that could be accommodated following the build out of the Centre by 2030.

Table 18: Existing Land Use Diversity Table

PLUC Code	Planning Land Use Category (PLUC)	Core Floorspace	Frame Floorspace	PLUC Code	Residential Precinct Floorspace
PRI	Primary/Rural	0	0	PRI	0
MAN	Manufacturing/Processing/Fabrication	0	0	MAN	0
STO	Storage/Distribution	0	750m^2 (archival approval)	STO	0
SER	Service Industry	149m^2	0	SER	0
SHP	Shop/Retail	14,555m^2	1,457m^2	SHP	513m2
RET	Other Retail	200m^2	0	RET	0
OFF	Office/Business	738m^2	2,250m^2	OFF	570m2
HEL	Health/Welfare/Community Services	0	0	HEL	600m2
ENT	Entertainment/Recreational/Cultural	0	0	ENT	0
RES	Residential	0	3,200m^2 (units fronting Gilbertson Road)	RES	0
UTE	Utilities/Communications	0	0	UTE	0
VFA	Vacant Floor Area	0	0	VFA	0
VLA	Vacant Land Area	0	0	VLA	0
Total		**13,776m2**	**7,657m2 (inclusive of residential)**		

Table 19: Floorspace Breakdown:

Precinct	Existing Floorspace Breakdown	Projected 2030 and Beyond
Core	Retail: 13,776m^2	Retail: 22,244m^2 Non Retail: 8,692m^2
Frame	Retail: 1,457m^2 Non Retail: 3,000m^2	Retail: 4,457m^2 Non Retail: 7,000m^2

Based on the retail and non-retail floorspace projections the land use breakdown far exceeds the diversity performance outlined within SPP 4.2 of 30%. 37% of the total commercial floor area will be allocated to non-retail floor space. At the current stage, the non-retail floorspace is unknown of what the make-up of this area will be. However, it is envisioned that a mixture of office and entertainment land uses occupy the District Centre as the density and residential population growth increases over the life cycle of the ACP.

6.2 Land Use Clusters

Within the ACP boundary the land use clusters have defined how the precincts are separated (Core, Frame and Residential). Generally the District Centre contains the majority of the commercial activity shared between the Core and Frame. There are however, some smaller commercial land uses such as a child care centre, office and shop land uses (petrol station and beauty spa) along Gilbertson Road and fronting South Street. To align the ACP to accord with this, additional uses are proposed for properties that directly interface with the Centre along Gilbertson Road as well as including the service station, convenience store and beauty spa. Beyond this, the wider residential area is characterised by low-density residential housing and has no discrete character, hence the grouping of the residential into one precinct within the ACP.

6.3 Retail

The Kardinya District Centre was developed as a suburban 'box' shopping centre but has begun the process to transform into a more diverse Activity Centre with the proposed shopping centre redevelopment. This development application was submitted with a supported Retail Sustainability Assessment to demonstrate the existing capacity to provide additional retail floorspace based on a number of factors.

The City's Local Commercial Activity Centres Strategy (2013) conversely states that the Centre does not have capacity to expand unless there are increases in catchment (through population increase) or significant attractors are provided. This LCACS was prepared and made assumptions based on a number of errors such as including existing non-retail floorspace as retail floorspace, not taking into consideration the daily influx of persons from a wider catchment from surrounding attractors (e.g. Murdoch University, Fiona Stanley Hospital and St John of God's), lack of nearby competing district centres and high accessibility from a regional road network (South Street and North Lake Road). Regardless, the redevelopment of the Kardinya Park Shopping Centre will provide additional attractors through diversification of non-retail offerings and the proposed density increases will provide a population increase to improve the catchment.

The proposed expansion of the Kardinya Park Shopping Centre will provide an anchor for additional density in this location as the level of amenity associated with the expansion will be attractive for investment outside of the Core area. Retail and commercial markets require critical mass. The co-location of a number of retail and entertainment businesses not only lifts the profile of a centre but facilitates the provision of services and amenity that contribute equally to overall amenity, attractiveness and desirability of a centre for development to occur within the residential precinct. This will provide the necessary increase in catchment area.

A Retail Sustainability Assessment has been conducted for the proposed shopping centre expansion with the following key findings of relevance:

- ***Centre Mix:*** *The Kardinya Park District Centre is currently a relatively small centre focussed on convenience food retail, homewares and specialty uses. A review of the floorspace mix compared to centre averages illustrates that the Centre has a relatively low level of floorspace across a range of categories, including food retail, food catering, apparel and homewares, and no mini- majors. The proposed development aligns with these observed gaps. While the composition of out-of-centre retail floorspace is unconfirmed, it is likely to be focussed on additional specialty floorspace that is not strongly represented in the local area.*
- ***Catchment:*** *Kardinya Park's location at the intersection of two major road routes and tenant mix that includes, for instance, the only Kmart between Booragoon and Rockingham supports an expanded catchment – particularly to the south and west where there are limited comparable centres.*
- ***Redevelopment Activity:*** *Re-zoning and state and local government focus on infill development is driving increased development activity and population growth. There are several infill precincts under development such as Kardinya Heights (300 residents), Gallery (250 residents) and the Murdoch Health and Knowledge Precinct. In addition, re-zoning of areas*

surrounding Kardinya Park is supporting small scale sub-divisions and unit development, with forecasts developed for the City of Melville and City of Cockburn indicating population growth of 54% in Willagee, 13% in Kardinya and 61% in Coolbellup. Furthermore, historical population growth and gentrification has seen significantly increased and changing spending patterns which is supporting retail floorspace need at Kardinya Park. Additionally, the Activity Centre plan includes a residential zoning increase on 51ha of residential land that is set to be equivalent to 1,216 dwellings (net of current dwellings).

- ***Worker and Student Population:*** *In addition to the resident catchment, Kardinya Park benefits from proximity to Murdoch University, the Murdoch Health and Knowledge Precinct and numerous service industry and industrial areas (such as Bibra Lake and O'Connor) which accommodate approximately 57,500 jobs.*
- ***Retail Spend:*** *Over the five years to 2023, annual retail expenditure generated by residents in the main trade area is forecast to increase by an average of $14 million p.a. (1.2% p.a.). With population growth forecast to increase after 2023, expenditure is forecast to increase at a rate of $26 million p.a. in the five years to 2028.*
- ***Retail Need:*** *The existing hierarchy has been established for more than four decades and there has been limited expansion of retail floorspace in the area; particularly over the past two decades. Combined with changing spending patterns (e.g. more food and entertainment spending), there is significant forecast growth in floorspace need in the trade area equating to approximately 45,000 sqm of retail floorspace. The proposed development is expected to accommodate a relatively small proportion of this forecast additional need.*
- ***Benefits:*** *The proposed development will partly address this observed retail need and will also include a range of non-shop retail uses that will help activate the Centre day and night. The improved mix and desirability of the Centre will support increased infill development, a revitalisation of the Activity Centre and complement the Murdoch University and Garden City developments. Importantly, the redevelopment will also support a range of additional ongoing employment opportunities (estimated at 785 jobs).*
- ***Retail Turnover Impact:*** *This analysis demonstrates that there will be sufficient market demand to support the proposed scale of additional PLUC 5 (shop retail) uses within the Kardinya Park Shopping Centre without having a significant impact on the sustainability of centres within the Activity Centre hierarchy. The analysis found that the impacts will be moderate and distributed across a range of centres given the proposed expansion predominantly includes retail categories that are not adequately provided by other district and lower order centres in the area.*

Source: Kardinya Activity Centre Retail Sustainability Assessment – Prepared by Urbis for Dato Holdings Pty Ltd dated January 2020.

The LCAS also states that the vision for the future of the Centre should be considered in the context of the role the Centre is playing in meeting local demand for goods and services, and the role it plays in the overall Activity Centre hierarchy. Given the factors listed above from the RSA and the increase in floor space proposed still being within the acceptable limits for a district centre, the Activity Centre will function into the future at a district level without competing with other district centres or disrupting activity levels within nearby Activity Centre of differing hierarchy.

See Appendix 1 for further detail on the suitability of the retail proposed within the locality.

6.4 Community Infrastructure

Much of the community infrastructure for the existing ACP catchment is contained within an agglomeration of community facilities at Morris Buzacott Reserve. This includes an existing bowling club, community centre and sporting facilities (junior football and hockey facilities). It is anticipated that this will service the current and future catchment from a community infrastructure perspective. It is also noted there are multiple surrounding facilities within a 3km radius beyond the immediate ACP catchment such as Lakeside Recreational Centre, Samson Recreation Centre as well as Murdoch University proving a range of sporting and cultural facilities.

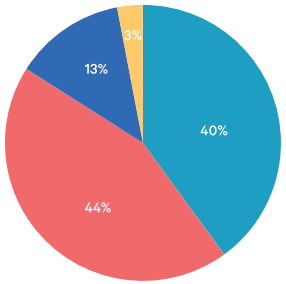
6.5 Employment

Perth and Peel @ 3.5 million central sub-regional framework has identified an overarching vision and key objectives for the economic development in relation to the future growth of the Perth and Peel regions. A key objective of the framework is to improve:

- *"access to a wider range of jobs by providing for an urban environment and dwelling options attractive to a range of workers and consumers;*
- *the relationship between where people live and work, and reduce commuting impacts and the associated costs; and*
- *the distribution of employment across Perth and Peel with a focus on the creation of strategic employment opportunities within the Activity Centres, while maximising use of existing infrastructure, that can complement and support existing regional-level facilities, which will result in the agglomeration of uses."*

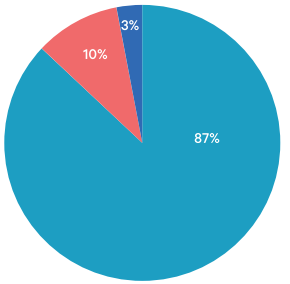
The central sub-regional framework has further objectives to:

- *"encourage and facilitate growth for the purpose of delivering employment opportunities;*
- *create employment opportunities within the local area sub-region which utilises local labour force skills to increase employment self-sufficiency within the local government area; and*
- *cultivate and strengthen relationships with key stakeholders."*



Family Composition – Kardinya

- Couple family without children
- Couple family with children
- One parent family
- Other family



Dwelling Typology (occupy) – Kardinya

- Separate house
- Semi-detached, row or terrace house, townhouse etc
- Flat or apartment
- Other dwelling

As of the 2016 census, there were 4,884 people who reported being in the labour force who live in Kardinya (suburb). Of these 53.8% were employed full time, 34.4% were employed part-time and 7.6% were unemployed which is relatively consistent with the Western Australian averages.

The most common occupations in Kardinya included Professionals 25.8%, Clerical and Administrative Workers 15.1%, Technicians and Trades Workers 13.4%, Managers 11.6%, and Sales Workers 10.4%. The number of professionals in the locality is proportionally higher than the state average of 20.5% with slightly higher family and household income than the Western Australia averages.

Source: ABS 2016

The expansion of the retail, entertainment and commercial functions within the Core of the site will provide further employment opportunities within the locality for not only Kardinya, but also the wider region. As stated within the RSA, there is projected to be an additional 745 jobs to be created as a result of the ACP implementation namely in retail and office/medical and other non-retail activity proposed within the Core Precinct of the ACP area. Implementation namely in retail and office/medical and other non-retail activity proposed within the Core Precinct of the ACP area.

6.6 Dwellings and Population

The main principle of infill development is to facilitate higher densities close to areas of public transport and amenity, including retail and public open space. The ACP increases residential density and encourages multiple dwelling development to enhance the housing choice and relative affordability for all ages within the Activity Centre.

The existing suburb of Kardinya has 86.7% of all occupied dwellings being separate houses with 91% of the separate houses having 3 or 4-bedrooms according to the 2016 census data (note: 9.3% of all dwellings are not occupied). This indicates a distinct lack of diversity of housing stock. When considering the household composition is 40% couples and 13.4% one parent families, Kardinya as a suburb is in definite need for increased diversity of housing stock to cater appropriate for the household mix currently present (ABS, 2016).

Densities are proposed to range from R60 up to R160 outside of the 'Core' and 'Frame' with densities increasing closest to the 'Core'. Inside the Core, the residential density is proposed to be capped by height rather than plot ratio due to the limited area residential development can be built upon due to the existing tenure and site constraints (i.e. existing centre).

Gross hectare is defined as:

> *"the area of zoned land under the region planning scheme i.e. excluding the area reserved for parks and recreation, railways, primary and other regional roads and public purposes".*

The gross area of the Kardinya ACP is approximately 58 hectares, excluding South Street (Primary Regional Road) and North Lake Road (Other Regional Road). The area within the 400m ACP radius to the west of the Core has not been included in the density changes due to the difficulties in pedestrian access to the Core and Frame of the Centre as well as the relatively high quality and age of the housing stock – making redevelopment of this area unlikely. It is also noted within the MSACSP, this area is excluded from being subject to density increases.

The ACP is calculated to provide for 1,875 dwellings which equates to approximately 32 dwellings per gross urban hectare. Within the identified ACP area, there is currently approximately 629 dwellings, equating to 10.8 dwellings per gross hectare.

The calculations are derived from multiplying the land areas by the permitted plot ratio associated with the proposed density codes and dividing this area by an average dwelling size (nominally 80m^2). This dwelling calculation is based on a moderate growth scenario with 50% uptake of redevelopment potential to the full development potential as advocated in within SPP 4.2. The moderate growth scenario also takes into consideration the likelihood of under-development of some of the properties.

The table below provides an estimate of the possible population and yield growth over the next three decades from 2020 – 2050. The table below is assumed on an average and gradual density uptake based on 50% growth of the achievable yield. The residential growth has also assumed that the density uptake is wholly by multiple dwellings determined by plot ratio, rather than grouped dwellings which is determined by site area. However, withstanding this, by applying the 50% density uptake across the identified ACP area, it will take into consideration, the underdevelopment of properties, particularly on the fringes with lots being identified as R40.

Table 20: Total Additional Dwellings

Year	Projected Additional Dwellings
2020-2025	312
2025-2030	624
2030-2035	936
2035-2040	1,248
2040-2045	1,560
2045-2050	1,875

LEGEND

- ACP Boundary
- 4,800m² — Total Area
- 00 — Additional number of dwellings

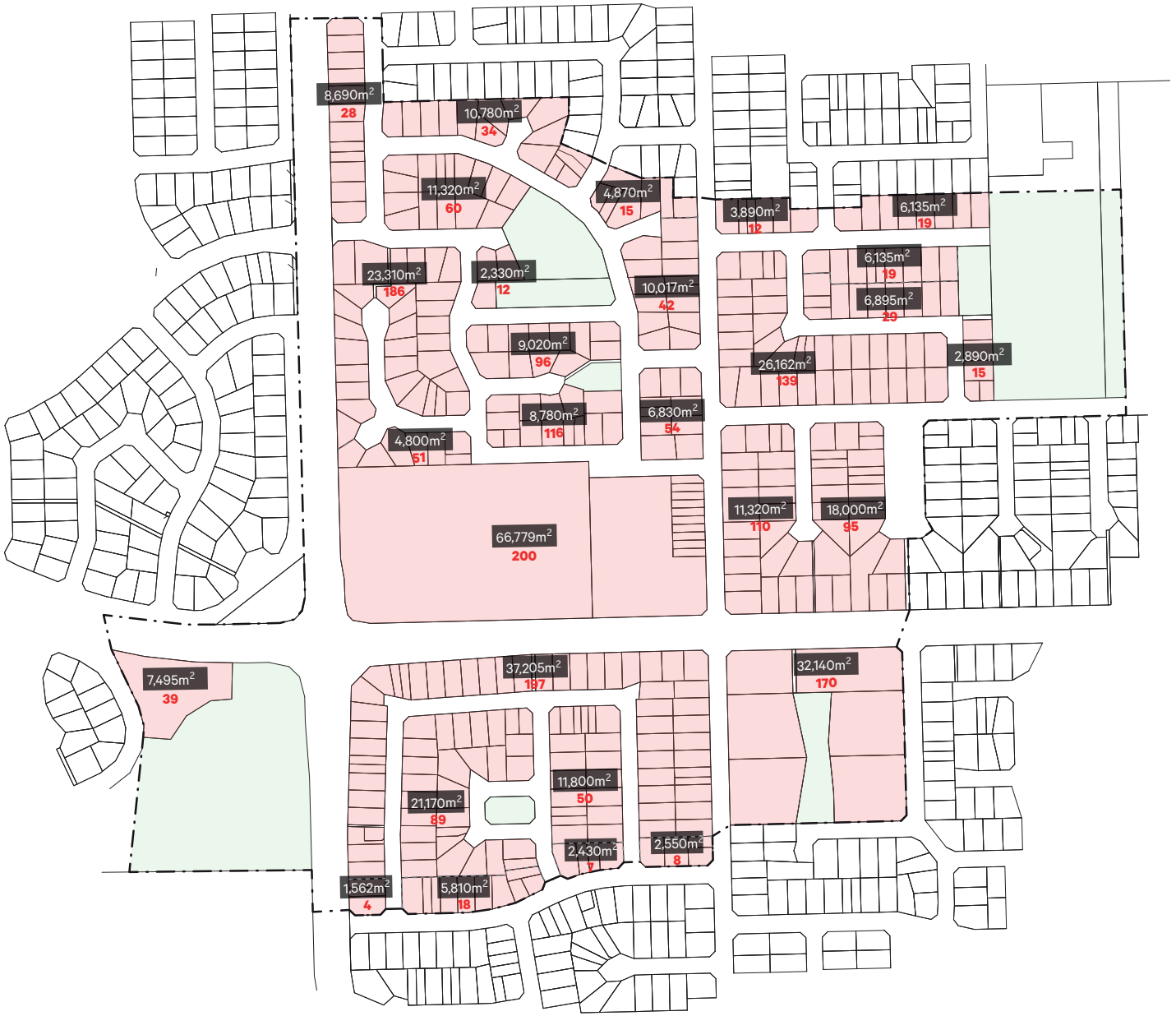


Figure 19. Cell Breakdown Dwelling Projection

7. Urban Form

7.1 Urban Structure, Character, and Built Form

The Perth and Peel @ 3.5 Million Central Sub-Regional Framework identifies South Street as an 'Urban Corridor' as it is also a high-frequency public transit corridor, and is therefore highly suitable for increased residential density, with potential for mixed land uses where appropriate.

In recent years, the concept of urban corridors has been promoted as a way of achieving integrated land use and transport outcomes. Urban corridors provide a connection between train stations and Activity Centres and operate not just as roads for the movement of vehicles or reserves for major infrastructure but provide locations for increased and diversified places for people to live and work, where appropriate. It is important that intensifying development does not adversely impact upon the efficient operation of the local and regional transport network. Maintaining and enhancing the urban amenity is also a key objective when considering areas for intensification.

The predominant building typology in the study areas is detached single dwelling houses (86.7%). There are a number of grouped dwelling sites to the south-east of the Activity Centre area which are less likely to change over time due to land fragmentation (strata titled). Single houses in the study area are predominantly single-storey, with newer residential developments tending towards two-storeys.

Existing retail and commercial buildings are typically internalised or surrounded by car parking to the front and servicing to the rear. The building form varies; however, majority is aging and single storey in nature with poor pedestrian amenity/access to and around these buildings.

The provision of new urban form will need to seek to implement an urban edge and provide higher density housing which is appropriate for the urban corridor context (in terms of residential amenity). The Activity Centre response will seek to create controls which are in line with SPP 7.0 and SPP 4.2 in terms of intensity, function and form.

7.2 Precincts

The precincts have been separated into three key areas, Core, Frame and Residential. A summary of the separation of each precinct is detailed below:

The Core

The Core represents the greatest intensity of commercial activity within the ACP and is the key driver behind sustained economic growth within Kardinya. The Core also provides the function of being the Centre point of activity, connectivity and social interaction. The objectives for the Core area:

- Concentrate non-residential development within the Centre Core.
- Enable the growth of the retail component to allow for a high quality retail experience while maintaining the Centre's district centre role.
- Improve the maturity of the Centre, by promoting a range of commercial, retail and entertainment choices to meet the needs of the locality.
- Encourage uses such as entertainment and hospitality that are likely to extend the period of activity within the Centre.

Existing Built Form, Layout and Structure

The Core, defined as Kardinya Park Shopping Centre contains an existing 'box shopping centre' surrounded by car parking, that is greatly lacking in providing a streetscape presence to the wider public domain along North Lake Road and South Street but also importantly to the Frame. The existing Centre simply has no coordinated structure or layout. The Centre is dominated by exposed car parking areas which consume the site, and customers largely spend the majority of their shopping time within the confinements of the Centre.

Attributing to this lack of building interface, is the approximate 12 metre land fall from North Lake Road to the Frame. This 'hole' the existing Centre is located within provides some extreme site challenges to being able to extend the built form to the public domain.

The land fall also provides some challenging pedestrian and vehicle access issues within the site. Currently safe and convenient pedestrian access along North Lake Road and South Street is non-existent, requiring many pedestrians to enter the Centre via the existing carparking areas with no clear or linear access points into the Centre. Furthermore, vehicle access and movement is also congested and unsafe particularly towards the western end car parking area where the sites topographical constraints have the greatest impact, affecting the useability of the western car parking area.

Ownership and Anchor Tenancies

The Core is held under one ownership. The existing Centre contains multiple smaller tenancies; however the major anchor tenancies are both Coles and K-Mart which occupy the greatest area of floorspace within the Centre.

Heritage, Underutilised Land & Reuse

Kardinya Park Shopping Centre contains no heritage listed buildings. The Centre is largely fully tenanted, with little to no unused building and/or tenancies on-site. Furthermore there are no heritage listed buildings within Kardinya District Centre. Whilst the Centre occupies the majority of the site via either the Centre itself or the car parking areas, it is considered the site is substantially underutilising the land, particularly in regard to the extent of car parking in comparison to the level of occupancy. The preparation of a travel smart plan will assist in lowering the overall car parking rate, along with attracting land uses to the site that that will not require mandatory use of private vehicles such as entertainment and food and beverage land uses.

Opportunities for revitalisation and reuse for the site are expansive both within the immediate future and the longer term. The Core will continue to have a strong commercial presence however is in dire need of land use diversity, particularly with regard to the entertainment, food and beverage options. The Centre itself remains in good condition and any proposed redevelopment schemes will see the Centre remaining, however being expanded to provide a higher level of land use diversity.

Centre Frame

The Frame has been nominated as the supporting site of the Central Core Precinct. The Frame, whilst providing some economic and entertainment opportunities, is limited in its future projections as servicing the community as a central node for commercial activity. The Frame is limited due to the future allowance provided within the RSA for both retail and non-retail floor space and therefore it is considered that the precinct has more of an opportunity to become a mixed use (commercial / residential) precinct rather than a substantial amount of additional retail floor space.

Existing Built Form, Layout and Structure

The Frame, unlike the Core has a more defined urban structure to enable pedestrians to traverse through the site. The Frame is much more accommodating to pedestrian movement, given the fragmentation in buildings enable for improved connectivity between the tenancies. However, the pedestrian environment is lacking in appeal, safety and activity. Many buildings have blank walls and back-of-house to potential pedestrian linkages, there are large amounts of unscreened parking and multiple access and egress points making vehicle movements unsafe and conflict with pedestrians inventible. The Frame also includes 11 dwellings which all have individual crossovers to Gilbertson Road, further creating disruption to traffic movement with no ability to obtain rear vehicle access from the service lane.

The built form of the Frame has no relationship to the wider public domain. Similar to the Core, buildings are setback into the site, and there is a lack of street corner activation to create bookend entry statements, particularly to the corner of Gilbertson Road and South Street. Furthermore, there is a clear divide between the landownership of Kardinya Park Shopping Centre and the adjacent tenancies as there is no connection points between the site. The building typology is all single storey development, with the building stock being of a similar age, with the most recent alteration being the ALDI fit-out.

Ownership and Anchor Tenancies

The major anchor tenancy for the Frame is ALDI with the Kardy Tavern also being reasonably popular given the lack of options for food and beverage within the immediate locality. There are multiple landholders within the Frame with the commercial tenancies all being strata titled. The eleven residential properties fronting Gilbertson Road, are also individually titled further contributing to the fragmentation of the Frame. It is foreseen that this ownership fragmentation will likely impede redevelopment of the Frame for immediate future.

Heritage, Underutilised Land & Reuse

The Frame has no heritage listed buildings that are required to be considered within the ACP. Similar to the Core the existing buildings are considered to be underutilised given the site locations within an urban corridor and furthermore the extent of level of car parking is expansive for the uses provided. It is not considered likely that the existing buildings will be repurposed and incorporated into one whole redevelopment scheme. It is envisioned, that the existing buildings will be demolished, and either the site is sold as one development lot or smaller lots are subdivided to form part of the larger District Centre precinct.

The objectives for the Frame are below:

- Promote mixed use medium and high density building typologies.
- Provide for additional complementary retail floor space and non-retail floor space growth to encourage employment and activity to support the Core retail district.
- Encourage a high quality built form that incentivises pedestrian movement and directly links the Centre Core, Centre Frame and the Residential Precinct through a positive pedestrian experience.
- Promote greater housing density with managed interfaces to surrounding residential areas and transport corridors.

Figure 20. Built Form Imagery

Residential

The Residential precinct has been grouped as one precinct given there is no specific additional controls required based on locational factors to facilitate appropriate development in this precinct. The content of Vol. 2 of the R-Codes (SPP 7.3) requires that apartment development takes into consideration the site and wider context when designing a new development which is further supported by the 10 key design principles as contained within SPP 7.0.

The intended densities have been selected to not only meet the requirements of SPP 4.2 in terms of dwelling per hectare targets for a District Centre (30 dwellings per hectare), but to also ensure transitional building height across the ACP area. This will ensure that building height and massing will be scaled down as the distance from the Core increases and interface appropriately with existing single residential outside the periphery of the ACP boundary. The objectives of the Residential zone are below:

- To offer a diverse range of medium density grouped and multiple dwelling housing opportunities.
- To ensure built form and building height provides for appropriate transition into surrounding existing residential areas.
- To provide a density that will support the viability and vitality of the Centre and will support public transport infrastructure and reduced car use.
- To optimise density around areas of amenity such as POS or the Core and Frame.

Existing Built Form, Layout and Structure

The wider residential area has been grouped as one precinct given there is no large change of character throughout the catchment. Whilst each residential area (north, south, east and west) has been discussed independently, it is considered appropriate to group together as one precinct. The existing built form of the residential catchment is dominated by single and grouped dwellings, often single storey products. Unfortunately the wider catchment has seen limited quality infill developments, which is largely due to the limited density increases restricting the viability of more densely built development products.

The layout of the wider residential area is a combination of cul-de-sac subdivisions that feed out onto larger more traffic centric environments such as Gilbertson and Williamson Road. Pedestrian movement is also limited. There is lack of pedestrian footpaths particularly within the local road network, and existing PAW's which provide pedestrian access to North Lake Road and South Street lack passive surveillance and activation.

Whilst the layout and structure of the residential area is largely already defined, by providing an increase in residential density and improvements to the public realm will enhance how pedestrians traverse throughout the wider residential catchment.

Heritage, Underutilised Land and Reuse

There are no State or local heritage listed buildings within the residential catchment that require special consideration within the ACP. The surrounding residential catchment would necessitate being considered as underutilised. Whilst it is noted the residential density needs to increase, the surrounding residential land is deemed to provide an optimal use of the existing land supply surrounding the Centre.

7.3 Building Envelopes

The building envelope for the Core has been largely shaped by the approved development application, which provides a detailed understanding of the capacity and layout of the Core. Whilst it remains ambiguous how the Frame may choose to develop, the provisions contained in Part 1 of the ACP report, mandate specific heights, setbacks, and retention of internal road connection points, that will help shape the redevelopment of the site.

To assist with this understanding, in conjunction with the approved DA, and building envelope plan has been prepared which indicatively demonstrates the layout of the Frame and how it will feed into the approved Kardinya Park redevelopment. The surrounding residential precinct is not considered to be necessary to include within this plan, given the outcome of these sites will largely be dependent on prospective developers and consistency with the R-Codes.

Refer to Figure 21 – Building Envelope

Figure 21. Building Envelope

7.4 Defining the ACP Boundary

A high level of investigation and analysis was undertaken to how best define the ACP boundary. Whilst SPP 4.2 prescribes a 400m walkable catchment from a District Centre to achieve 30 dwellings per hectare, it was determined that this did not necessarily create the most appropriate streetscapes and building interfaces.

It has also been recognised following input from the City, their desires to increase densities along transit corridors such as South Street and North Lake Road. The current LPS identifies lots fronting South Street and North Lake Road as 'high density residential'. Whilst the LPS does not specifically define the City's expectation of density along the transit corridor it is anticipated a density between R80 – R160 would be appropriate in ensuring that any future up-coding the City undertakes, will align with what is envisioned under this ACP and SPP 7.3 for a 'high density residential' street noting that the height of 4 storeys is considered more acceptable due to the need to transition height down to single residential. This will prevent the need for any future amendments and ensure a consistent approach between the two investigation processes.

A further consideration of defining the ACP boundary was understanding where the boundary finished, particularly for lots fronting transit corridors given the intent under the strategy to create high density environments for the length of these corridors. In this regard, whilst the ACP has recognised the vision under the strategy and fulfils the partial objective under this ACP, it also needs to be noted that the drive behind the ACP was to align with the performance targets of SPP 4.2 to secure the Centres future retail catchment. Therefore, future investigation beyond this retail catchment should be undertaken by the City in isolation to this ACP process to fulfil the City's vision under the strategy, and not at the expense of an individual landowner to investigate.

At the current time, it is unknown when the City will commence their investigation of up-coding properties along the transit corridor, in accordance with their LPS. This level of uncertainty made it essential to investigate the best available locations within the catchment of the ACP to buffer and transition the impacts of higher density environments, to lower density lots to limit intermediate conflicts between building heights and streetscapes whilst future planning occurs.

A detailed analysis was undertaken to limit the impacts of density on properties located outside of the ACP boundary. The analysis prepared below was conducted on the northern, eastern, southern and western residential areas to ascertain how to best define the ACP boundary and transition building height to properties on the periphery. Whilst a key emphasis was placed on ensuring the ACP boundary was guided by the 400 metre walkable catchment, this didn't always provide the best outcome and future interface. In this regard, a detailed site analysis and street audit was conducted to assess, where required, where the ACP boundary should conclude. This analysis looked at site features such as roads, POS and existing PAW's that would assist in buffering and transitional density.

The summary below explores the key characteristics of the following street environments and there level of appropriateness to buffer the transitional density.

1. Eastern Residential Catchment

Burney Court

Located approximately 260 metres east from the Centre point of Kardinya District Centre. Burney Court has an approximate road reservation of 18 metres and has a combination of recently subdivided dwelling typologies, with some colonial style dwellings remaining. Burney Court has a PAW to South Street which is approximately 2m in width. There are some small to medium sized street trees present within the road reserve, however generally tree canopy is low.

Hodgson Place

Located approximately 375 metres east from the Centre point of Kardinya District Centre. The defining characteristic of this street is the centrally located POS within the road reserve. This provides a much larger separation between housing, with a total street width of approximately 44 metres. The centrally located POS within the road reservation provides the opportunity for a higher amount of street trees, further enhancing the separation of the built environment. Whilst located on a cul-de-sac the turning movement of vehicles is much greater than other cul-de-sacs audited. This will allow waste collection much easier in these locations. The housing stock is also mixed, with some recent small subdivisions and builds that have occurred, as well as some existing colonial style housing remaining. Hodgson Place also has the widest PAW out of all of the streets audited with an approximate width of 4 metres.

Walker Court

Located approximately 480 metres from the Centre point of Kardinya District Centre. Walker Court has an approximate road reservation of 18 metres. The housing typology within this street is mixed. There have been some lots that have been subdivided and built on, with some remaining housing. A narrow PAW is also provided connecting Walker Court to South Street. The PAW has an approximate width of 2 metres. The streetscape quality for Walker Court is appealing with high quality street tree amenity being provided.

Sexton Court

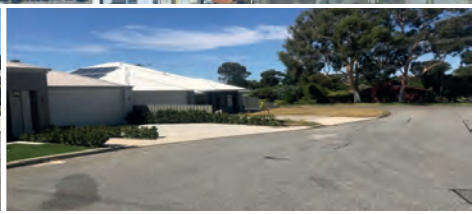
Located approximately 600 metres east from the Centre point of Kardinya District Centre. Sexton Court has an approximate road reservation of 20 metres. Out of all of the audited streets, Sexton Court has the most untouched original housing profile, with the exception of one lot being split into two 9.5 metre free-hold lots. The street amenity of Sexton Court is reasonably attractive also. The street is well vegetated by multiple large street trees contributing to the amenity of the area. A 3 metre PAW is also provided from Sexton Court through to South Street.

Following the audit being completed, it was clear that the most appropriate street to reduce infill density conflicts between high density and low density environments was Hodgson Place. The two characteristics that lead to this decision was firstly, the substantial road reservation width, being double any of the other road reservations along the transit corridor. Secondly the PAW that is currently provided being 4 metres in width, will further help reduce any future impacts of bulk and scale on directly adjacent residences if development proceeds in the interim of the City undertaking up-coding investigation. This was considered the most appropriate street to both align with the City's LPS, whilst also contribute to improving the retail catchment of the Centre.

In looking beyond Sexton Court, it was noted as the distance from Kardinya District Centre increased, the housing profile appeared to be more stable. Dwellings within this area were much more established, with limited to no infill development occurring. The profile of the dwellings was also assessed as being slightly more refined and maintained. Withstanding the fact that this area is far beyond the District Centre catchment, from the analysis undertaken it is not considered that this area would be appropriate for higher density housing stock at this current point in time.

It is was also seen there was a large opportunity to increase density in close proximity to Morris Buzacott Reserve. The large area of POS could service a large degree of residents within the catchment and would provide a high-amenity outlook, further incentivising redevelopment opportunities. Lots that were either directly adjacent to the POS or were in a walkable proximity were deemed to be appropriate for medium-higher density zonings.

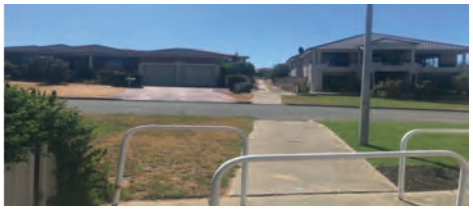
2. Northern Residential Catchment



The northern residential catchment was largely viewed as the most accessible catchment to the Centre based on the street layout and connectivity to the District Centre. Based on this, the northern catchment is proposed within the greatest level of residential density with R160 and R80/R160 prescribed for lots that are immediately fronting the District Centre. As the distance from the District Centre increases density, and in-turn building height will decrease.

On the fringes of the northern residential catchment, applying a density code of R40 has been deemed acceptable to provide an appropriate interface, whilst not be obstructive to surrounding residential properties. To maintain consistent streetscapes, the R40 density has been stopped mid-block, to preserve the traditional streetscape along Loris Way whilst ensure the lots that front Dalston Crescent interface appropriately with R60 properties. The R40 is proposed to further extend along North Lake Road with the ACP boundary using Piercy Court to separate the R40 density from the adjacent R25 zoned lots.

3. Western Residential Catchment



The majority of the western residential catchment has been excluded from the ACP. This is due to the existing high quality character of this area, as well as the significant level of investment, would make redevelopment limited within this area. Given this it is considered to not be appropriate for rezoning within this area. It is also noted, the western residential area to the Kardinya District Centre was excluded from rezoning under MSACSP. There is also undulating topography within this area, making redevelopment difficult. This particular residential catchment is also more segregated than surrounding residential areas and does not have the same connectively as other analysed areas. There is only one lot that has been included within the ACP, due to the sites strategic location. Currently the site is occupied by two-storey townhouses restricted to retirees. However due to the sites location to Alan Edwards Park, the segregation of the site from surrounding lower density residential properties and the sizeable landholding, there is the strategic opportunity for redevelopment of this site. Notwithstanding this lot, all other western orientated residential properties have been excluded from being included within the ACP.

4. Southern Residential Catchment

The southern residential catchment was investigated thoroughly to determine the suitably for increases in density. The current area has a mixture of R25, R40 and R80 zones throughout the area. There is a combination of dwelling products within the residential catchment, with some recent grouped dwelling developments occurring as well as some older built-strata town house products. Like many of the other residential areas, the key intent was to create appropriate interfacing densities that are of the same or similar nature to create a cohesive streetscape. To align with the LPS, R80 is proposed along South Street and North Lake Road, R60 is proposed internally fronting the POS with an R40 density being positioned along Bellairs Road, to transition to the current R25 zoning.

7.5 Density

The applied density zones have been carefully considered throughout the ACP area. The key principle that has underpinned the zones is to intensify built form within the Core and Frame, and transition building height from the Centre to the periphery of the ACP area. To understand the rationale of the proposed densities the following principles were applied throughout the ACP:

- High density codes are proposed within the immediate vicinity of the District Centre to encourage density in close proximity to local amenities and services.
- Encourage consistent and commensurate streetscapes by imposing R40 density codes on the periphery of the ACP. The application of R40 has been dependant on the streetscape and interface that will be created. The ACP has proposed the R40 density in most instances to stop mid-block to ensure consistent streetscapes, with existing R25 properties. Streets such as Loris Way, Sweeney Street and Ochiltree Way have been applied with this principle to ensure a consistent R25 – R25 interface, with the R40 density code being applied to interface with a similar abutting density code. This ensures the preservation of existing streetscapes on the periphery of the ACP boundary, whilst creating consistent streetscapes for lots that redevelop in the future. It is also noted, that due to the northern orientation of these lots, the mid-block zoning of R40 will have no detrimental impact on the solar orientation of lower coded properties.
- There is one exception to this principle with lots that front Bellairs Road, where the R40 density stops at the road interface rather than mid-block. This has been deemed appropriate in this instance, due to many properties along Bellairs Road have already undergone redevelopment, and in this regard the uptake of the R40 density would not be as prevalent. It is also noted that if an R40 density extended to the adjacent side of Bellairs Road, there would be a greater potential for detrimental impacts to overshadowing given the northern orientation. Finally the interface between R25 and R40 has similar controls by way of street setbacks and building height.
- To support a greater uptake of development capacity, split density codes are proposed as part of the ACP for sites that are most at-risk for poor development outcomes to occur. These lots are typically irregular in shape, have vehicle access restrictions, and currently do not provide high levels of amenity to encourage higher quality medium density products. The larger a property is, the fewer the design limitations such as vehicle access, parking, deep soil zones and utilisation of areas that would have been utilised as setback areas on smaller properties. These efficiencies result in an improved built form outcome and hence should be incentivised through additional height and plot ratio as the negative outcomes can be mitigated on larger sites, more simply than smaller more confined lots. Therefore, a split density code will allow development to a higher density code when land amalgamation has occurred, whilst still allowing some development potential for smaller parcels of land which could provide an alternate housing product (i.e. smaller apartment complexes).
- The application of the R80 density code has been applied as a transitional density code to enable an appropriate interface with both higher density codes (R100) and lower density codes (R60) given the similarity in controls and built form outcomes. There have been some exceptions to this principle where the R80 density abuts a lower density code (R40/R25). Whilst the ACP has aimed to restrict this, there are three instances of where this is considered acceptable:
  - The corner of Ralston Road and Gilbertson Road, where four lots zoned R80 interface with an R40 zone. This was seen as a strategic opportunity to maximise the development outcome particularly as these lots have three street frontages which can be utilised. By applying a high density code, encourages land amalgamation and more appealing redevelopment opportunities.
  - The R40 density along Bellairs Road abutting an R80 density code along North Lake Road and Gilbertson Road. The R80 density code was applied to accord with City's LPS, however was not deemed appropriate to directly interface with R25 lots. Therefore the R40 was applied as a transitional zone.
  - The final instance is five lots fronting Morris Buzacott Reserve, of which an R80 density code has been applied adjacent to a R25 zoned property fronting Williamson Road. The R80 density has been applied, given the interface with the POS. The site represents a strategic redevelopment opportunity which should be maximised through an appropriate density code. The interface with the R25 lot is limited to one property, and given Williamson Road is separating the two zones, there is little impact foreseen from this density change.
- Part 1 of the ACP includes a control within the Residential Precinct to force amalgamation between multiple lots. This has been applied due to the access concerns for lots fronting South Street, having direct access onto this regional road. To prevent this outcome reoccurring, prospective developers/landholders will need to amalgamate their landholdings into parcel sizes as set out within Part 1. The parcel sizes outlined within the ACP have been encouraged given the irregular lot sizes and also to ensure that no lot is left out from the opportunity to remove their vehicle access from South Street. Therefore, the ACP mandates that no further development is supported on these lots unless all land parcels have been acquired and incorporated into the redevelopment scheme. Whilst it is recognised this will be a challenging feat for a developer to coordinate in some instance ten independent landholders given the land fragmentation, it will provide the best outcome for both cul-de-sacs (Burney Court and Hodgson Place) whilst protecting South Street and neighbouring development sites.
- There is only one lot that was included to the west of the District Centre, No.42 Gillett Drive. The lot is proposed to be up-coded from R25 to R80. The site is currently occupied by an existing over 55's facility and contains 12 dwellings. This site represents a key opportunity for redevelopment given the sites position to Alan Edwards Reserve, and interface with South Street. It is considered a density of R80 is appropriate and will provide a high level of flexibility to accommodate future redevelopment opportunities.

The density codes and controls proposed shall appropriately deliver density around the District Centre, that both respects the existing and future streetscapes, as well as segregates incompatible zones to deliver a cohesive infill precinct.

Existing In-fill development product in Kardinya

Intended Density Products

7.6 Building Height

Within the Centre within both Core and Frame and height of 15 storeys has been prescribed, with an additional allowance of 5 storeys for the corner aspects of the site detailed as landmark locations. The key drivers for the height proposed are:

- MSACSP prescribes a minimum 35 dwellings per hectare to be achieved within the District Centre. To be able to deliver this level of density in conjunction with the site maintaining its commercial floorspace, building height is essential to deliver this type of density envisioned under the MSACSP. Based on 35 dwellings per hectare the site would be required to deliver 231 dwellings to meet the minimum. This is a substantial level of dwellings, and the only feasible method of achieving this target is through maximising building height.
- The District Centre is segregated from existing residential properties by the surrounding road network e.g. South Street, North Lake Road, Gilbertson Road and Dalston Crescent / Brophy Street. This makes the site ideal to accommodate building height, given it will have no direct impact on adjacent residents.
- The site is located along a transit corridor that has existing high-frequency bus services, connecting residents to both Murdoch and Bull Creek Station.
- The orientation of the site being located directly north will provide optimal amenity into future residential buildings, whilst limiting the impacts of solar access on adjacent properties given the separation between adjacent sites, particularly to lots South of the Centre.
- Restricting building height to 5 storeys along Gilbertson Road will commensurate with the proposed R100 density code.
- Allowing for an additional 5 storeys on the corner elements of the site, will highlight the entry to the District Centre, and help enhance the architectural features to the public realm.
- The site is strategically located in close proximity to large employment nodes such as Fiona Stanley Hospital and Murdoch University of which there is currently an undersupply of higher density units within the immediate vicinity of the area.

The controls set out within Part 1, prescribe no plot ratio for both the Core and the Frame. The intent behind this, is to allow for flexible redevelopment opportunities that are not confined to a broad plot ratio control. In this regard, the layout of the Frame will be restricted to two halves, as the access will be required to be retained. This automatically defines the footprint of the site, along with the northern portion of the Frame, also being required to retain the north-south internal road connection. In addition, the ten lots fronting Gilbertson Road will further limit the building envelope as these properties are restricted to 5 storeys to accord with the R100 density code on the opposite side of Gilberton Road. It is further noted, the controls prescribed within State Planning Policy 7.3 – Apartments, will further mandate building separation requirements, visual privacy, provision for communal open space etc. are factors which will impact the apartment building. For this site in particular, it is not considered plot ratio to be an accurate guide as to the quality of the residential outcome of this site into the future.

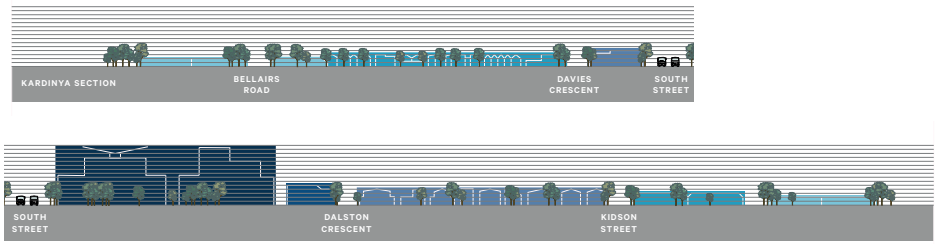


Figure 23. Building Height Cross-Section

7.7 Building Height – Residential

The building height requirements have been prepared to promote high-quality built form outcomes as well as provide densities to encourage appropriate development. Due regard has also been given to lots on the periphery of the ACP area, to ensure potential building heights that border external lots are cognisant of the future interfaces intended under the ACP. The building height for the Residential Precinct will remain in accordance with the R-Codes to reduce the layers of overlapping planning frameworks.

7.8 Street Interface and Setbacks – Centre

The Centre's Core and Frame currently provide a poor interface to surrounding road networks and pedestrian corridors. The focus of mandating frontage typologies is to nominate the type of built form interface relative to the environment both current and future. The existing centre is disconnected, and a large part of this is caused by the large open areas of car parking that segregates the two sites. To improve this interface, concealing exposed ground level car parking areas is vital to improving the amenity of the area. To achieve this, creating a built form interface with the key connections throughout the site is at the core of the ACP. This vision will help transform the District Centre from a car dominated environment, to a more pedestrian centric place supported by a built form, that encourages and facilitates pedestrian activity.

A key objective of this ACP will be to improve the street interface for commercial/retail and newer higher density developments. This can be achieved through extending the built form of the Core of the Centre to the street corners and maximise visual interest and materially with attractive and vibrant building frontages.

The provision of weather protection and pedestrian amenity will also be implemented through the Activity Centre response. Provisions are included to ensure development provides appropriate passive surveillance and interaction with the public realm. A detailed overview of each frontage typology is provided below.

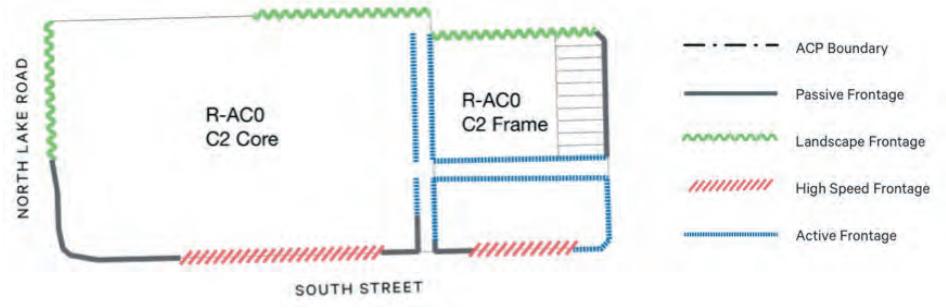


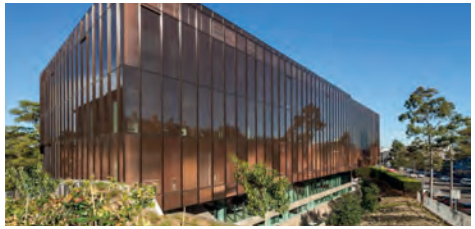
Figure 22. Centre Interface Plan

Active Frontage: This frontage is for highly projected pedestrian environments where a high level of activation and clear visual engagement with the street is required. Built form in these locations shall be developed with nil setbacks, optimal ground floor engagement and centre piece podiums.

Passive Frontage: This frontage type is proposed for areas which are highly visible but do not necessarily accommodate highly active functions. High quality design features are to be provided in facade elements in these locations. Built form in these locations shall be developed with maximum articulation, reduction in building mass directly abutting the street, and high use of awnings to accommodate the pedestrian environment.

Landscaped Frontages: This frontage type is intended to attractively buffer and screen building facades that are restricted in providing a high quality interface such as a servicing areas. It is intended the landscape frontage will provide a combination of screening techniques, both hard and soft features to create interesting and attractive facades that are otherwise left untreated and create an unsightly environment.

High Speed Frontages: This frontage type reflects built form that this experienced from passing vehicles where pedestrian movement is predominantly low. Built form shall incorporate a range of materials, textures, lighting and landscaping to provide visually appealing frontages.



7.9 Street Interface and Setbacks – Residential

The strategic intent for the Residential precinct of the ACP was to allocate densities that are of similar height and setbacks in accordance with DesignWA to create cohesive streetscape environments. Streets that are linear and will into the future have a definite setback line, have been provided with the same density code to ensure the future residential interface is cohesive e.g. Ralston Road.

Table 21: DesignWA Primary Controls

Density Code	Minimum Primary Street Setbacks	Building Height
R40	4m	2
R60	2m	3
R80	2m	4
R100	2m	4
R160	2m	5

7.10 Environment & Amenity Impacts

The ACP will be wholly reliant on the City's scheme to guide incompatible land uses within both the Core, Frame and wider residential area. In this regard, it is not considered necessary for the ACP to develop controls to preserve amenity given land uses will be regulated via the permissibility table.

7.11 Public Spaces

The residential catchment of the Kardinya is already well in excess of POS, with multiple large sporting ovals and smaller community parks located in close proximity to residents. A detailed breakdown is provided below:

- Alan Edwards Reserve (36,000m^2) – Located on the southwest corner of North Lake Road and South Street. Reserve contains a large sporting orientated park which caters for AFL and cricket to the eastern side inclusive of pavilion for sporting clubs. There is also more vegetated open space for light exercise and dog walking provided to the western side of the park along with a playground and seating area. There is a significant level difference to the south of the open space with the open space sitting substantially lower than the properties to the south.
- Morris Buzacott Reserve (38,888m^2) – Located on the eastern boundary of the ACP area. Large sporting oval, with communal family gathering facilities.
- Laurie Withers Reserve (11,646m^2) – Located within the northern residential catchment. Small residential reserve with a playground and seating areas. It is well vegetated with mature trees and surrounded entirely by residential properties.
- Jack O'Keefe Reserve (1,581m^2) – pocket park with mature vegetation, located within the southern residential catchment.
- Harry Patterson Park (4,877m^2) – pocket park, with communal family facilities and playgrounds.

Total: 9.2ha - 15.8% of the total ACP area

The public open space provided within the Activity Centre totals 9.2ha which equates to 15.8% of the total ACP area. This is consistent with the statutory and strategic aim for the Perth metropolitan area. Outside of the Activity Centre area there are other local reserves at Frederick Baldwin Park and Dick Piercy Park within close proximity which offer extensive active and passive recreation opportunities, as well as significant balance area of Morris Buzacott Reserve that is 12ha. In this regard, there is ample POS for the ACP catchment, and therefore any future development approvals will not require POS contributions given the existing over supply within the ACP area.

Whilst traditional POS remains highly important for the growth of a community, the Core and Frame have limited to no public community spaces that combine landscape, recreation and entertainment into one space. Currently, the District Centre is largely defined by attracting shoppers to undertake their weekly shop and leave without having any sense of engagement or activity. Whilst this may appeal to some of the demographic of Kardinya, there remains a large percentage of existing residents who are seeking more activity and vibrancy, rather than needing to travel to other centres. To deliver this, well-designed public spaces will be vital to the success of the District Centre moving forward, as the population increases, and the demographic changes. The current DA for the Core Precinct will deliver active public spaces in the food and beverage areas for social interaction and community gatherings.

The ACP will help facilitate the creation of numerous public spaces to improve customer experience and greatly improve the level of recreation and entertainment opportunity to contribute to the sense of place of the District Centre. These public spaces will require a high level of detailing to facilitate activity and develop a sense of place. Design elements such as landscaping, public seating and artwork that can be used in conjunction with active land uses.

North-South Main Street Connection (South Street to Dalston Crescent)

The north-south connection is an essential vehicle and pedestrian connection for both Lot 31 and Lot 17 as well as providing accessibility for residents to the north of the Centre from Dalston Crescent and beyond. The right-of-way, whilst in under the ownership of Lot 17, provides reciprocal access right to Lot 31. This connection is the most strategically positioned aspect of the site that will provide the opportunity for both sites to easily connect into to develop that 'Main Street' environment. The connection is also aligned with the key principles of developing a main street in accordance with Liveable Neighbourhoods 2007. Element 7 – Activity Centres, outlines the key principles of creating a main street environment, these can be summarised below:

- *'Pedestrian-scale retail main streets work best on streets that have traffic volumes in the range of 10.000 – 18.000 vehicles per day, but only have two lanes of slow-moving traffic (30km/h) and on-street parking;*
- *Main street environments will be only 200-400 metres long; and*
- *Other influences on the main street locations will include climate (e.g. often north-south orientations are preferable), key views, relationship with major destination facilities.'*

The objective for this space is to create a pedestrian centric environment that seeks to reconnect both Lot 31 with Lot 17. The built-form should have active ground floor frontages, weather awnings, street trees and the ability to on-street park. The main street will be supported by a direct connection to larger anchor tenancies, whilst providing a separate shopping, food, beverage and entertainment environment. Hames Sharley have provided some visioning images to demonstrate the potential future interface between the two sites.

East-West Main Street Connection (Gilbertson Road into the District Centre)

The east-west connection currently provides secondary horizonal road access to link mostly cars from Gilbertson Road into the site. This internal road is currently dominated by private vehicle usage, with very limited pedestrian opportunity given the lack of footpaths, canopy and being generally dominated by private vehicle usage.

Whilst the current usage is an undesirable characteristic of the District Centre, there is a large opportunity to further link the two sites, given the proximity this entry has to the intersection of Gilbertson Road and South Street. This will provide the opportunity particularly for those residents who live south of South Street, to cross with the traffic lights and walk to this connection. This will remove the need for residents to walk along South Street, which is highly exposed road network, and is considered an undesirable pedestrian environment. In addition to this, there is also a large catchment of residents who live east of the Centre, that will provide a direct and linear pedestrian route to the north-south main street. A circular bus route between Murdoch and Bull Creek train station also stops directly outside of this access point. This further reinforces this corridor as a future linkage opportunity.

The future redevelopment of Kardinya Park has also recognised this opportunity and has directly located the stair-case that connects Lot 17 and Lot 31 to the entertainment and leisure precinct to the align with the site corridor of pedestrians approaching from Gilbertson Road.

Kardinya Park Shopping Centre Carpark (Corner of South Street)

The existing centre is positioned towards the rear of the site and provides little to no interface with the wider public realm. The South Street corner is underwhelming upon approach, with exposed car parking dominating the interface. To address this, there is a key opportunity for the site to emphasis the street corners, particularly where the proposed main street is located to provide that sense of arrival and activity. A key opportunity exists to provide clear signage and active land uses on this street corner that are directly accessible from the main street via the centrally located stairs to signify the entry into the Core.

This public space is aimed to include community benefit land uses, food and beverage, causal alfresco seating and landscaped areas accessible to the public. This space, is ideally positioned to contribute to the activity of Kardinya Park Shopping Centre and will also improve the activity and vibrancy to the periphery of Lot 31, further contributing to enhancing the connection between these two sites. Hames Sharley have provided some indicative imagery as seen with the Development Application, of what is intended of the South Street main street corner.

Aldi Carpark (Adjacent to Tavern)

The current building interface along the east-west corridor connection is extremely limited in activity and surveillance. Large portions of exposed car parking are on display upon approach which creates an unsightly pedestrian environment. Whilst car parking is essential to the current operation of the Centre, as the density increases and the Centre evolves it is envisioned that the demand for car parking bays will eventually reduce, and furthermore, can be designed in a more effective manner to be sleeved by building facades.

To contribute to the main street activity, it is envisioned that whilst there should active uses to the ground floor to complete the main street, there may be an opportunity for the area behind to be used as an active public space. This space may include space for a pocket park, informal dining seating or a flexible space for customers, employees or market stalls. It is envisioned that this space will provide a key opportunity to be used in conjunction with the existing Tavern and the proposed food, beverage and entertainment precinct, whilst contributing to the vibrancy of the main street.

7.12 Landscaping

The ACP is proposing to improve the public realm of both the wider residential catchment as well as improve connections within the District Centre. Landscaping plays a significant role in providing shade, habitat for fauna, reducing the heat island effect and providing general amenity within the Centre. In this regard the ACP promotes the retention, replacement or offset of trees on development sites where achievable.

The landscaping pallet of the District Centre has been defined by the approved Development Application which provides the foundation for a north-south Main Street connection and an east-west connection through to Gilberton Road. An easement in-gross is proposed to provide a 7.5m road width to create suitable vehicle access throughout the Frame. In addition to this Part 1 contains provisions which include the provision of a minimum 1.5 metre footpath to be provided and street trees to develop the main street environment. Plan E has provided an indicative landscaping strategy of how the Frame could connect into the Core via upgrading the road treatment, providing street trees and enhancing pedestrian connections.

Refer to Figure 24 – Landscaping Strategy for Activity Centre

The broader residential area has also been investigated. As noted, the public realm environment is generally poor, with a lack of pedestrian footpaths and shade trees. Part 1 of the ACP proposes two key provisions to enhance this environment through developers contributing to a footpath and secondly providing a street tree when each lot is redeveloped. Three streets were nominated as performing particularly poorly, Bersica Court, Davis Crescent and Hutchings Way. The cross-sections provided demonstrate how these streets would be transformed via the provision of a footpath and trees being placed within the verge. Plan E has provided some indicative cross-sections based on the current road width.

Refer to Figure 24 – Landscaping Street Sections

LEGEND

01 THE PAVING PATTERN IS AN OVERSIZED ABSTRACT VERSION OF THE PATTERENED CONCRETE WITHIN THE ELP & PEDESTRIAN SPINE IN THE SHOPPING CENTRE

02 RAISED INTERSECTION SIGNIFIES A CHANGE IN TRAFFIC SPEED & ENHANCES THE PEDESTRIAN CONNECTIVITY TO KARDINYA PARK

03 RETAINED STREET TREES WITH RAIN GARDENS PROVIDE AN INSTANT ESTABLISHED FEEL

04 NEW STREET TREE PLANTING ENHANCES THE STREET AND MITIGATES THE HEAT ISLAND EFFECT

05 NEW POCKET PARK

06 SLOPED TURF BREAKOUT SPACE FOR EXPLORATORY PLAY AND INFORMAL SEATING

07 RAISED PLANTERS PROVIDE INFORMAL SEATING OPPORTUNITIES AND ADDITIONAL TREE PLANTING TO CREATE A COMFORTABLE MICRO CLIMATE

08 NEW PEDESTRIAN CROSSING

09 BICYCLE PARKING TO MEET COUNCIL RECOMMENDATIONS

10 FEATURE SHADE STRUCTURE WITH CREEPER PLANTING AND RAISED PLANTERS UNDERNEATH THEM THAT PROVIDE SEATING OPPORTUNITIES

KARDINYA PARK ACTIVITY CENTRE

PREPARED FOR HAMES SHARLEY ARCHITECTS

LANDSCAPE CONCEPT PLAN

IUNE 2020

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PLAN E

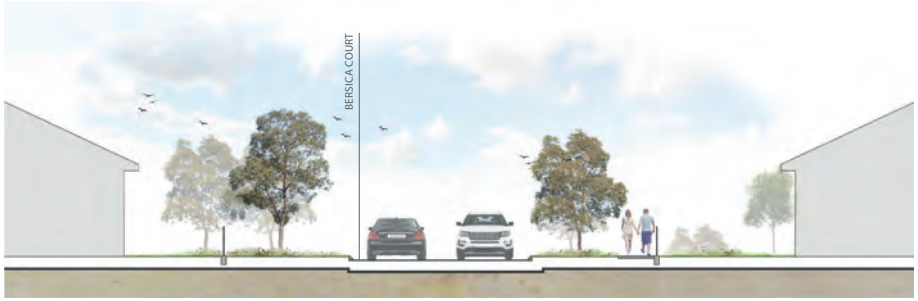
LANDSCAPE ARCHITECTS

414 ROKEBY RD SUBIACO WA 6008

T: (08) 9388 9566 E: mail@plane.com.au

Figure 24. Landscaping Strategy for Activity Centre

SECTION A-A
BERSICA COURT

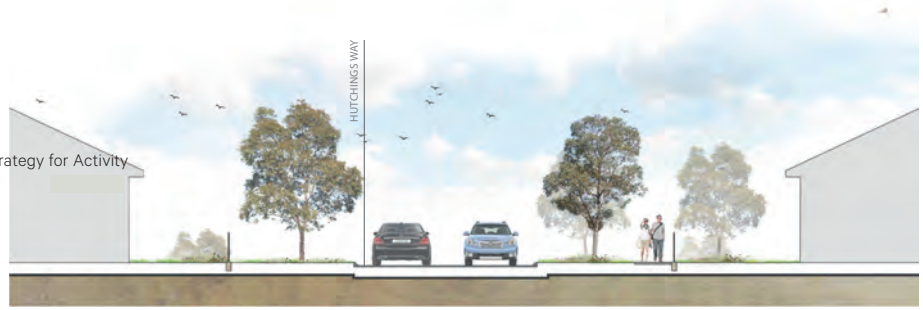


SECTION A-A

SECTION B-B
DAVIES CRESCENT

SECTION B-B

SECTION C-C
HUTCHINGS WAY



SECTION C-C

Landscaping Strategy for Activity Centre

KARDINYA PARK ACTIVITY CENTRE

PREPARED FOR DATO HOLDINGS PL

STREET CROSS-SECTIONS

JUNE 2020

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Figure 25. Landscaping Street Sections

7.13 Key Nodes, Landmarks, and View Corridors

The ACP area has some opportunities for new developments to capitalise on views to the City to the north and to the escarpment to the east due to the undulating topography from the south-west down to the northern parts of the ACP area. There are also changes to the topography through the site which will require detailed site analysis when designing new multiple dwelling developments to ensure that views of significance are maintained for future developments and also to ensure that landmarks can be created to assist with wayfinding through the Activity Centre.

Volume 2 of the R-Codes now includes provisions around site analysis and design response to require developments to response to the physical elements of the site and desired local character of the locality. This will which will help identify the key nodes, opportunities for landmarks to be created and developed upon as well and ensuring any view corridors are maintained where possible.

7.14 Activity Centre Plan Response

The following opportunities and principles are applicable to the whole of the Activity Centre:

a) Provide active frontages and an urban edge to the Core and Frame with residential taper in intensity to mitigate impact of bulk and scale;

b) Ensure quality design that incorporates, celebrates and responds sensitively to the existing residential character and fabric within the suburb with appropriate transitions in density

c) Provide a human scale within the pedestrian environment and improve the overall pedestrian environment with upgraded streetscapes, greater weather protection and increased levels of activity (perceived or actual) for passive surveillance;

d) Ensure built form responds to existing important vistas and vantage points (sight lines/ views) where available;

e) Ensure new buildings reflect and respond to the natural local variation in topography and landform; and

f) Facilitate iconic development to create visual cues that assist with wayfinding and the formation of memorable elements within the Activity Centre.

Within the immediate surrounds of the Centre an R160 density has been applied which allows a building height of 5 storeys. The lots that are affected by the R160 density code have been strategically selected where building height can be segregated via existing POS and/or roads where the impacts of additional building height will have a limited impact on adjoining sites of lower density height.

Split density codes of R80/R160 been applied to lots to encourage land amalgamation and provide enough of an insensitive to encourage this outcome. Whilst the building height uptake between R80/R160 is not significant (1 storey) the plot ratio increases from 1.0 to 2.0 which will provide a large enough incentive to facilitate land amalgamation where appropriate.

The remainder of the density codes range from R60, R80 and R100 which provide a slight increase in building height between these density codes, whilst still having some uniformity to surrounding lower densities.

Height related guidelines is as follows:

- Maximum building heights shall be as per Figure 3: Maximum Building Heights;
- Building heights are to be measured in storeys;
- Structures associated with roof top terraces such as shade structures and alfresco areas are exempted from the prescribed maximum building height; and
- Plant areas and lift core rooms that are concealed from the public domain, however positioned on the roof of an apartment building are also exempt from the prescribed maximum building height.

As established in the section above, no further public open space is required to be facilitated as there is 15.8% of the area already dedicated to public open space of varying natures (passive and active). Additionally, communal open spaces will need to be provided as part of new apartment developments to diversify the open space provided within the locality (be it internalised and private in nature).

Volume 2 of the R-Codes and also SPP 7.0 provides the necessary controls to ensure that new commercial, mixed use and residential components will need to take into consideration the site context and character, built form and scale and legibility for not only individual development sites but also in the context of the wider area and hence additional layers of control are not as necessary.

8. Resource Conservation

Developments within the Kardinya Activity Centre will increase the viability and efficiency of existing infrastructure within the locality. Accordingly, the ACP will implement an aspect of sustainable development through more efficient use of urban land and resources by intensifying and consolidating land uses, including housing, which are located adjacent to public transport, employment, retail and commercial activity. The ACP will encourage active modes of transport which assist in reducing the dependence on private vehicles (and the associated emissions) and overall energy consumption within the locality in its implementation.

Further to this, the implementation of Vol. 2 of the R-Codes will also ensure that apartment developments within the ACP Area will have more sustainable design features implemented within new buildings, including energy and water conservation.

8.1 Water management and conservation

The planning and design of new developments will need to consider the contribution of the development to the water cycle and incorporates effective water management techniques that support quality of life and the provision of green space while moving towards a sustainable rate of water consumption. Ultimately as cost of water provision and consumption increase, market forces will dictate that developments are built to decrease on-going water consumption as an attractor for buyers and occupiers of new apartment developments. It is expected any commercial development demonstrates that a 1:100 ARI 24hr stormwater event is fully contained within the property boundary. A stormwater management plan shall be submitted at the time of a building permit to demonstrate compliance with AS 3500. Residential lots located below road level shall have drainage system designed to carter for a 1:100 ARI 24hr stormwater event, however properties that are above road level shall manage stormwater to a 1:20 ARI 1hr storm event. Residential lots located below road level shall have drainage system designed to carter for a 1:100 ARI 24hr stormwater event, however properties that are above road level shall manage stormwater to a 1:20 ARI 1hr storm event.

Stormwater management is another important aspect of water sensitive design and plays a vital role in protecting buildings from flooding and managing the water cycle, improving water quality, protecting ecosystems and improving urban amenity. The Department of Water and Environmental Regulation has defined a framework for the management of small, minor and major rainfall events in urban areas which have been incorporated into the provisions of the R-Codes relevant to residential and mixed-use development. Ecological protection is the desired outcome for management of a small event, which means that development should have sufficient stormwater infiltration and deep soil to manage a small rainfall event on-site. Serviceability and amenity are the desired outcomes for managing minor rainfall events on site.

Design guidance within the R-Codes encourages the use of potable water on-site to be reduced through means of water recycling, rainwater harvesting and the use of greywater systems, efficient 'water wise' irrigation and water fittings and planting of drought tolerant vegetation. The design guidance also goes onto encourage greater accountability for water use by installing individual water metering. Element 4.16 of Vol. 2 of the Residential Design Guides sets out three objectives pertaining to managing stormwater and reducing consumption. This will be the key statutory mechanism to impose best water management practices and shall be determined on a case by case scenario.

These measures when implemented will ensure decreased water consumption and efficient use throughout the water cycle to improve the sustainability of developments.

8.2 Energy efficiency

As energy demand and costs rise, so does the imperative to reduce energy consumption. Good design can deliver energy efficient dwellings that are attractive, healthy, and comfortable. Air-conditioning, water heating and lighting account for the majority of energy use in a typical apartment and hence reducing these costs through more sustainable design will have significant flow on effects for the on-going affordability for apartments in the locality.

Buildings will need to be designed to increase the thermal performance and incorporate energy efficient fixtures as per the requirements of Vol. 2 of the R-Codes through the requirement for new apartment developments to include at least one energy initiative to assist in reducing energy consumption or having all dwellings exceed the minimum NATHERS requirement for apartments. Examples of energy initiatives are the use of ceiling fans in habitable rooms, hot water systems more efficient than electric storage units, provision of external clothes drying, use of photovoltaic array for communal services, installation of a lift with regenerative breaking and solar powered lighting in communal areas.

The design of new apartment developments will need to be naturally cross ventilated and orientated to have access to winter sun for the majority of apartments which will further reduce reliance on mechanical ventilation and air conditioning. Having more openable windows in appropriate locations to take advantage of prevailing cool winds drastically decreases the reliance apartments will have on air conditioning to cool and improve air quality within apartments. Conversely, having balconies, other outdoor living areas and living areas within apartments oriented to have access to winter sun for a number of hours throughout the day will reduce reliance on heating and improve the amenity of these apartments.

Another more indirect method to improve the energy efficiency of apartments is to reduce the urban heat island effect through the provision of deep soil area and retention of mature trees for new developments. This will provide more shade and greater opportunities for landscaping on development sites to both improve the appeal and amenity of the sites but also the tree canopy across the suburb as it transitions from suburban to urban.

It is also anticipated that the Medium Density Volume of the Residential Design Codes (currently being drafted by the DPLH) will incorporate these same abovementioned provisions into the controls for medium density apartment and grouped dwelling developments.

All mixed use and apartment buildings within the Kardinya Activity Centre will need to comply with the Building Code of Australia to incorporate energy efficient initiatives into these buildings. This will ensure that public buildings across the Activity Centre will incorporate efficiency measures into:

- Building Fabric;
- External Glazing (excluding shopfronts);
- Building Sealing;
- Air Movement;
- Air-Conditioning and Ventilation Systems;
- Artificial Lighting and Power;
- Hot Water Supply; and
- Street Awnings.

As the Activity Centre matures, it is expected the standards of the Building Code of Australia will be amended to increase building standards for greater sustainability, so that when future development and redevelopment occurs, these developments be more sustainable than those being built today.

8.3 Water-Wise Landscaping

The City's local planning policy 2.1 (LPP 2.1) sets out within clause 6.5 the requirement for landscaping plans to incorporate the use of low maintenance, water wise plants with a preference to West Australian species. Whilst this provides the instrument to inform landscaping plans, LPP 2.1 does not prescribe any species to help guide and inform the detailed selection of native species. Whilst each landscaping plan is considered on its merits, and plant selection is based on the availability of species dependant on the season, a preferred plant species schedule is provided below, to inform future landscaping plans.

Ground Covers

Carpobrotus

Scaevloa

Sedum Rubrotinctum

Shrubs

Anigozanthos

Dianella Petite Marie

Synzygum

Trees

Gleditsia Triacanthos

Harpullia Pendula

Cupaniopsis Anacardioides

8.4 Waste

Increasing residential development increases waste and therefore the need for prudent waste management. Appropriate waste management plans are required to be supplied to local governments and included in approvals for multiple dwelling and mixed-use developments due to the LG servicing requirements. The R-Codes require that apartment buildings integrate waste management processes and facilities into the development to ensure convenient, efficient and safe access for residents and the relevant personnel. Waste management systems in multiple dwelling developments can be designed to foster and enable waste management behaviours consistent with this strategy.

Commercial developments are not usually held to the same standard as private collection is usually arranged. As costs for these services increase as land for waste becomes more difficult to acquire and recycling becomes more expensive, there will be a self-sufficiency for commercial developments to reduce their waste generation accordingly.

8.5 Activity Centre Plan Response

The existing planning framework in the form of Vol. 2 of the Residential Design Codes and future planning controls in the form of the Medium Density Code will provide adequate control for new developments to conserve and reduce consumption of resources. The use of design review to ensure the implementation of natural ventilation, solar access, energy efficiency and water conservation will promote these measures from the outset of apartment design rather than after-thoughts when the design has advanced past the point of effective implementation. These measures will increase the sustainability and reduce the on-going costs for these apartments considerably.

Further to this, the increasing costs of energy, water servicing and consumption and waste collection will likely result in landowners and businesses installing water saving fixtures, renewable energy generating devices (namely solar panels), thicker glazing and more efficient heating and air conditioning systems in existing buildings to reduce these on-going costs for the operations of these buildings.

9. Implementation

To implement the ACP as part of the objectives of SPP 4.2, the main implementation measure will be to amend the scheme to change the zonings and densities as appropriate. The Scheme Amendment will also give effect to the planning controls proposed within Part 1 of the ACP.

The updating of the scheme will result in a consistent framework for the assessment of development applications and subdivision within the ACP area and adjust existing controls to better reflect Kardinya's unique position as a large district centre.

9.1 Process

This plan has been prepared and will need to be publicly advertised and approved in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015.*

9.2 Statutory Planning Controls

This ACP is the principal planning document for this Activity Centre. State Planning Policy 7.3 (the R-Codes), the LPS 6 and the City's policies will also apply to development in this Activity Centre, unless specifically varied by this plan.

The plan, as endorsed by the WAPC, is a document which planning decision-makers are to give due regard to when making decisions regarding land use, subdivision or development in the ACP area.

9.3 Zoning

This plan does not automatically change the zoning of land. A Scheme Amendment to LPS6 is required to proceed the adoption of this ACP to facilitate the changes to the residential densities of the area and zoning the Centre to be C2.

The permissibility of each land use is stated within the Scheme for the Centre 'C2' and Residential zones and will not require amendment to facilitate the intended outcomes of this ACP as the ACP proposes to designate the land use permissibility of the C3 centre zone. Another clause is proposed to be inserted into the Scheme to reference the controls in Part 1 for the R-AC0 density code. These amendments will implement the ACP and therefore the Scheme Amendment falls within the criteria of a Scheme Amendment.

9.4 Monitoring and Review

This plan should be reviewed and updated as and when required. It is not intended to be a static document. Any amendments to the ACP will need to follow the procedures outlined in the Planning and Development (Local Planning Scheme) Regulations 2015.

9.5 Duration of the Activity Centre Plan

As per clause 44 of the Deemed Provisions within the Planning and Development (Local Planning Schemes) Regulations 2015, the ACP will have effect for a period of 10 years after approval from the WAPC. During this 10-year period, the ACP may be revoked or extended by the WAPC as necessary, depending on the change of legislation, market conditions and/or strategic planning framework change.

9.6 Collaborative working

Throughout the preparation of the ACP, the project team have been directly liaising with government bodies who have relevant input into the document. A summary of these meetings has been detailed below, it should be noted whilst these meeting were major milestone meetings, there has been additional conversations occurring with the relevant agencies in the lead up to the lodgement of the ACP.

It is intended that throughout the assessment of the ACP, cooperation between the City of Melville, the local community, State Government agencies and landowners within the Activity Centre area.

Table 22 – Summary of the Collaboration

Stakeholders	Meeting Date	ACP Input
Public Transport Authority	19 November 2019	• Discussed the relocation of bus stops surrounding the Kardinya District Centre to improve both pedestrian connectivity as well as improve vehicle safety. • Improvements to the quality and safety of bus stops. • Current servicing of Kardinya and community usage of the stops along South Street. • Opportunities to improve pedestrian movement across South Street and improve pedestrian safety.
Department of Transport	4 November 2019	• Discussed the preparation of Travel Smart Plans and Parking Management solutions to improve efficiency of the centres car parking. • Expectations on reducing the overall car parking rate for the Centre, and the ongoing management. • Transport and technology initiatives that will influence the accessibility to the Centre and surrounding employment nodes. • Improvements to legibility throughout the site based on the current arrangement of access points. • Facilitating safe pedestrian crossings across South Street to connect with existing bus stops.
Main Roads	19 November 2019	• Treatments and improvements to access points along South Street. • Intersection performances i.e. North Lake Road and Gilbertson Road and how. • Discuss opportunities to facilitate pedestrian movement across South Street.
City of Melville	15 January 2020, 3 February 2020	• Proposed zoning, density and population projections. • Density compatibility with the Local Planning Strategy, particularly along urban corridors. • Transitioning building height and developing cohesive street interfaces. • Methods to promote public realm upgrades e.g. footpaths and street trees.
Department of Planning, Lands and Heritage	15 January 2019	• Consistency between the proposed ACP and MSACSP. • Transitioning building height and creating consist streetscape interfaces. • Methods of restricting vehicle access onto South Street from existing lots. • Defining the 400 metre walkable catchment, and how far the ACP boundary should extend. • Retail floor space predictions and consistency with the Activity Centre Hierarchy.

9.7 Priority Actions

The table below sets out actions required to be completed and their priority to assist in the orderly and proper implementation of the ACP. The timing of each action will be broken down into three timeframes:

- Short Term: 1-2 years
- Medium Term – 3 - 5 years
- Long Term – More than 5 years

Actions	Timing
Local Planning Scheme Amendment	Short Term
Commence works for the Core, including: • Development of the main street proposal; • Improve pedestrian connectively within, around and into the site; • Redesigned access points for the Centre; • Construction of a new PTA bus-stop on the corner of South Street and North Lake Road; • Improve the built-form of the Centre to the public realm in particular on the corner of South Street and North Lake, as well as towards South Street; • Improvement of end-of-trip facilities; • Substantially increase the availability of cycling facilities; • Improve the interface Kardinya Park has with residents to the north, via landscaping improvements, and concealment of service lane; • Aim to reconnect the 'Core' and 'Frame' via pedestrian crossings and enhanced activity along north-south main street connection; • Improve car-parking design throughout the 'Core'; and • Investigate sustainability initiatives for Kardinya Park Shopping Centre e.g. (PV cells, stormwater retention initiatives and water wise irrigation).	Short Term
Prepare a Travel Smart Plan and Parking Management Plan for the Core.	Short Term & Ongoing
City of Melville to investigate underground power and improving street lighting via a special area rating being adopted.	Short – Medium Term
Main Roads to investigated modifying the traffic signals for the intersection of Gilbertson Road and South Street.	Short – Medium Term
Implementation of public-realm upgrades within the Residential Precinct (footpaths and street-trees).	Medium – Long Term
Road widening for the corner of Gilbertson Road and South Street.	Medium – Long Term
Public Transport Authority to investigate increasing bus frequencies for routes 512 and 115.	Medium – Long Term
Public Transport Authority and Main Roads to investigate dedicated AM and PM peak hour bus lanes along South Street.	Medium – Long Term
Development and improvements of the east-west main street connection. Which include: • Improvements to landscaping (shade trees and rain gardens); • Implement a paving concept consistent with the Core; and • Provide a 1.5m pedestrian footpath from Gilbertson Road to link with the Core.	Long Term

Project Team

element – Town Planning
Hames Sharley – Project Architect
Cardno – Traffic
Urbis – Retail
Pritchard Francis – Servicing
B & S Consultants – Project Manager
Clint Ford and Associates – Engagement

element.
the art and science of place

Hames Sharley

Cardno

URBIS

pritchard francis
Celebrating 40 years

B&S Consultants

Clint Ford & Associates
LOBBYING. COMMUNICATIONS. STRATEGY.

Appendix 1: Urbis Retail Assessment

URBIS

KARDINYA PARK

ACTIVITY CENTRE RETAIL SUSTAINABILITY ASSESSMENT

PREPARED FOR

DATO HOLDINGS PTY LTD

JANUARY 2020

CONTENTS

EXECUTIVE SUMMARY

KEY FINDINGS

The analysis and findings outlined in this report indicate that the proposed redevelopment within the Kardinya Park District Centre will deliver a net community benefit. The key findings supporting this conclusion are summarised below.

- **Centre Mix**: The Kardinya Park District Centre is currently a relatively small centre focussed on convenience food retail, homewares and specialty uses. A review of the floorspace mix compared to centre averages illustrates that the centre has a relatively low level of floorspace across a range of categories, including food retail, food catering, apparel and homewares, and no mini-majors. The proposed development aligns with these observed gaps. While the composition of out-of-centre retail floorspace is unconfirmed, it is likely to be focussed on additional specialty floorspace that is not strongly represented in the local area.

- **Catchment**: Kardinya Park's location at the intersection of two major road routes and tenant mix that includes, for instance, the only Kmart between Booragoon and Rockingham supports an expanded catchment – particularly to the south and west where there are limited comparable centres.

- **Redevelopment Activity**: Re-zoning and state and local government focus on infill development is driving increased development activity and population growth. There are several infill precincts under development such as Kardinya Heights (300 residents), Gallery (250 residents) and the Murdoch Health and Knowledge Precinct. In addition, re-zoning of areas surrounding Kardinya Park is supporting small scale sub-divisions and unit development, with forecasts developed for the City of Melville and City of Cockburn indicating population growth of 54% in Willagee, 13% in Kardinya and 61% in Coolbellup. Furthermore, historical population growth and gentrification has seen significantly increased and changing spending patterns which is supporting retail floorspace need at Kardinya Park. Additionally, the activity centre plan includes a residential zoning increase on 51ha of residential land that is set to be equivalent to 1,216 dwellings (net of current dwellings).

- **Worker and Student Population:** In addition to the resident catchment, Kardinya Park benefits from proximity to Murdoch University, the Murdoch Health and Knowledge Precinct and numerous service industry and industrial areas (such as Bibra Lake and O'Connor) which accommodate approximately 57,500 jobs.

- **Retail Spend**: Over the five years to 2023, annual retail expenditure generated by residents in the main trade area is forecast to increase by an average of $14 million p.a. (1.2% p.a.). With population growth forecast to increase after 2023, expenditure is forecast to increase at a rate of $26 million p.a. in the five years to 2028.

- **Retail Need**: The existing hierarchy has been established for more than four decades and there has been limited expansion of retail floorspace in the area; particularly over the past two decades. Combined with changing spending patterns (e.g. more food and entertainment spending), there is significant forecast growth in floorspace need in the trade area equating to approximately 45,000 sq.m of retail floorspace. The proposed development is expected to accommodate a relatively small proportion of this forecast additional need.

- **Benefits**: The proposed development will partly address this observed retail need and will also include a range of non-shop retail uses that will help activate the centre day and night. The improved mix and desirability of the centre will support increased infill development, a revitalisation of the activity centre and complement the Murdoch University and Garden City developments. Importantly, the redevelopment will also support a range of additional ongoing employment opportunities (estimated at 785 jobs).

- **Retail Turnover Impact**: This analysis demonstrates that there will be sufficient market demand to support the proposed scale of additional PLUC 5 (shop retail) uses within the Kardinya Park Shopping Centre without having a significant impact on the sustainability of centres within the activity centre hierarchy. The analysis found that the impacts will be moderate and distributed across a range of centres given the proposed expansion predominantly includes retail categories that are not adequately provided by other district and lower order centres in the area.

Overall, the proposed expansion is expected to deliver a significant range of direct and demonstrable benefits for the community whilst maintaining a sustainable existing and planned activity centre hierarchy.

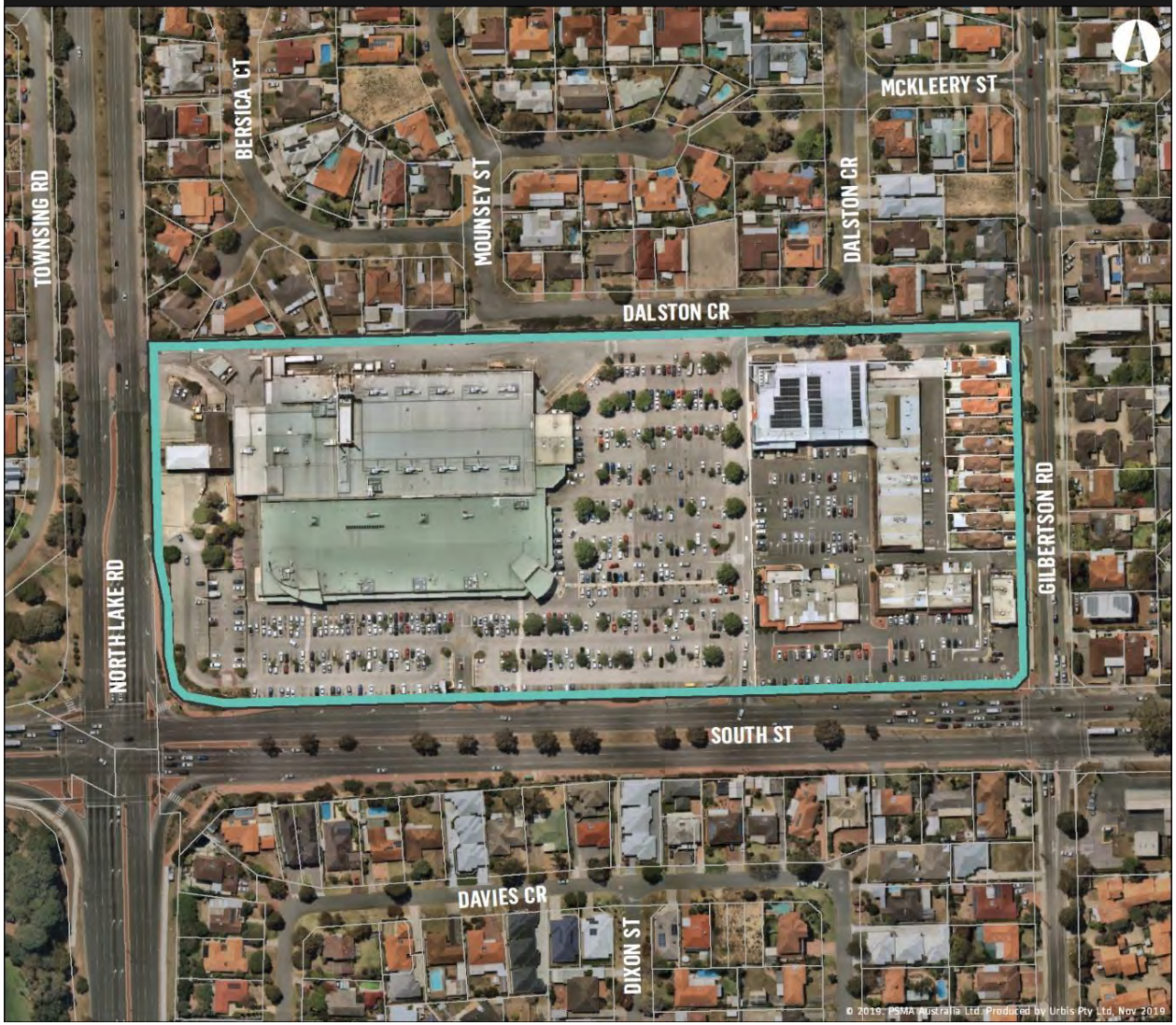
INTRODUCTION
STUDY BACKGROUND, PURPOSE AND STRUCTURE

STUDY BACKGROUND

BACKGROUND

- Kardinya and surrounding suburbs within the City of Melville are gentrifying and densifying areas in Perth's inner south western corridor. Infill precincts and redevelopment of large blocks have helped increase the resident population and the City of Melville Local Planning Scheme envisages further significant population growth. At the same time, the area's proximity to employment precincts and amenity have supported gentrification, with the average income for workers living in the area growing strongly over the past decade.
- Against this backdrop, the retail environment is fast changing in response to changing consumer spending habits.
- The activity centre offering however has not kept pace with population and income growth and changing spending habits. Many centres were built more than four decades ago and have not been substantially redeveloped since the 1990s.
- Kardinya Park Activity Centre, a popular District Centre which is anchored by the Kardinya Park Shopping Centre, is one of these centres. The activity centre is well-located and accessible in an area with very limited access to entertainment and food and beverage options. As such, the owner of Kardinya Park Shopping Centre is proposing a redevelopment which will incorporate a wider range of uses that are undersupplied in the area.

KARDINYA PARK ACTIVITY CENTRE

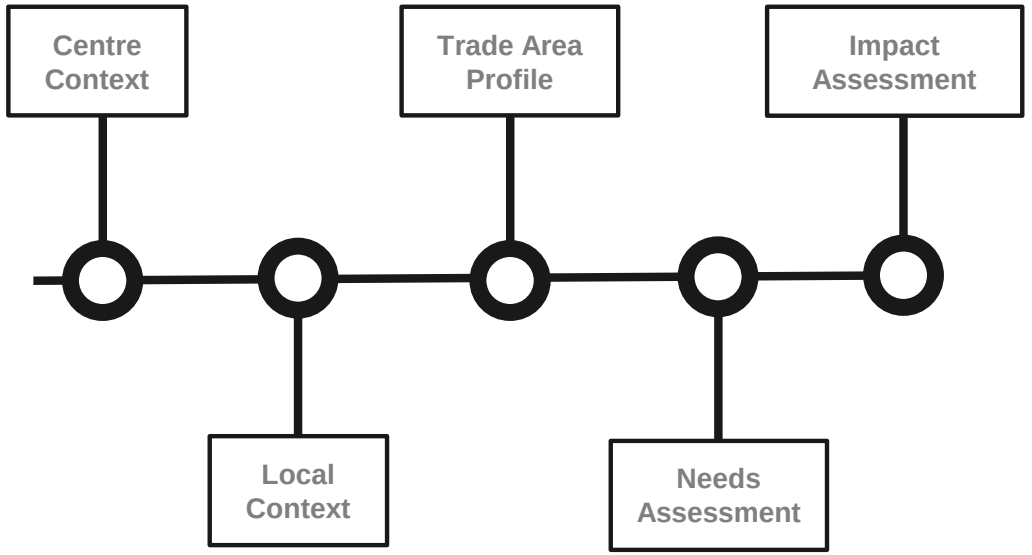


STUDY PURPOSE AND APPROACH

APPROACH

- Urbis was engaged to inform the redevelopment proposal and the development application process.
- This retail sustainability assessment (RSA) was developed to assess the proposed expansion, with focus afforded to the need for the development and the impacts on the activity centre hierarchy and local community.
- The RSA was developed in line with the requirements of SPP 4.2 Activity Centres for Perth and Peel and the City of Melville Local Commercial Strategy.
- This study included the following tasks.
  - ***Centre context*** – assessment of centre performance, mix and other attributes;
  - ***Local context*** – assessment of the competitive environment and urban development context;
  - ***Trade area profile*** – assessment of the attributes of the defined trade area;
  - ***Needs assessment*** – assessment of floorspace needs in the trade area; and
  - ***Impact assessment*** – assessment of expected impacts of the proposed redevelopment.

STUDY TASKS



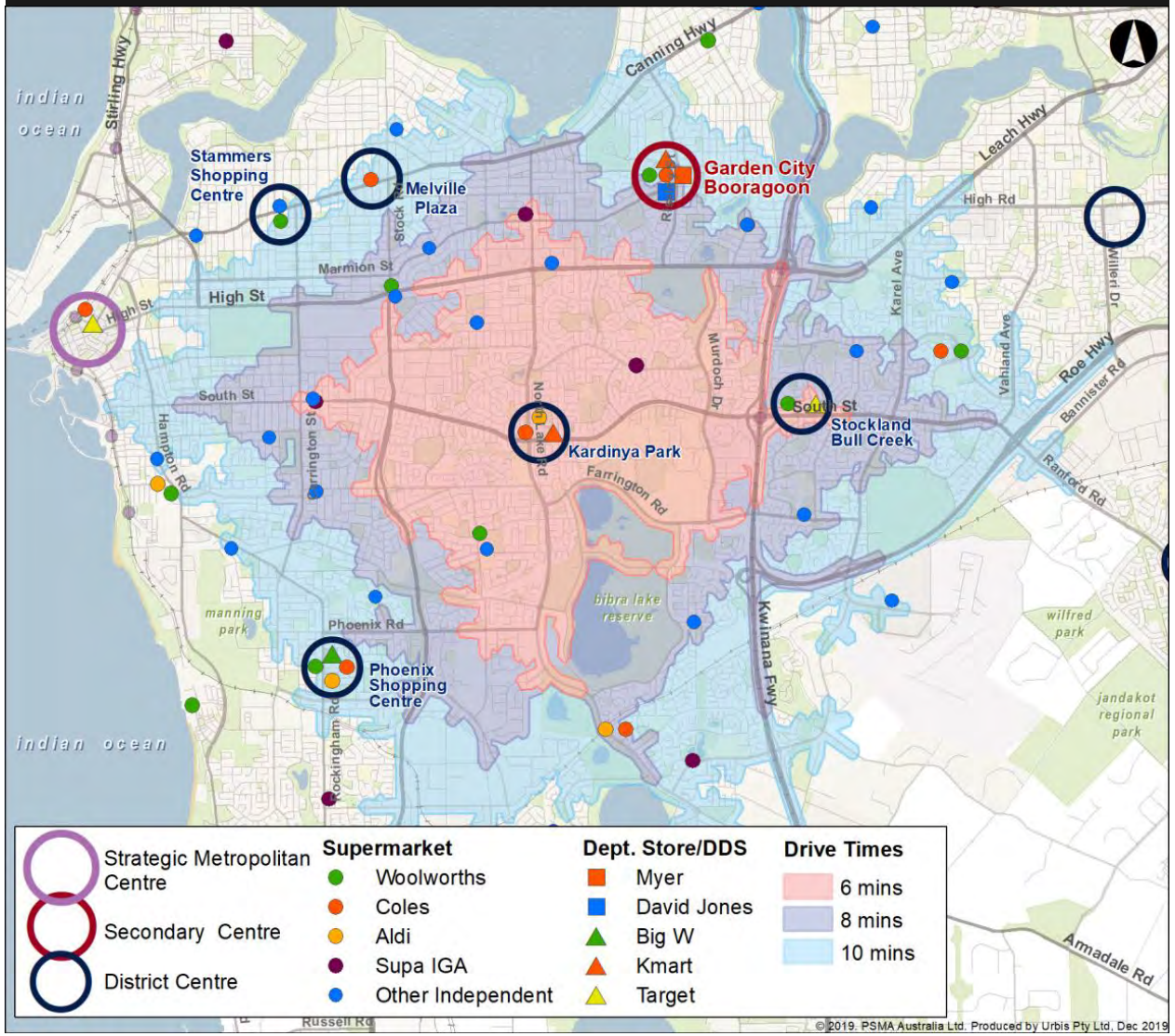
SECTION ONE
CENTRE CONTEXT

ACTIVITY CENTRE LOCATION

KEY INSIGHTS

- A review of the accessibility and transport context of Kardinya Park found that is has a range of positive location attributes which support the performance of this activity centre and the viability of the proposed expansion.
- The key attributes are noted below.
  - **Road Network**: Kardinya Park is located on the corner of South Street and North Lake Road. These are major roads with traffic volumes in excess of 30,000 daily vehicle movements. This supports passing trade and a broad catchment.
  - **Public Transport Provision**: Bus services regularly connect residential areas, Murdoch University and the Murdoch Train Station to this centre. It is also understood that there is a preliminary investigation for a light transit route connecting Murdoch Train Station and Fremantle.
  - **Pedestrian / Cycle Network**: There is an existing path network adjacent to major roads such as North Lake Road.
  - **Physical Barriers**: There are few physical barriers affecting access to this centre apart from Beeliar Regional Park, the Kwinana Freeway and Roe Highway which could act as a barrier for residents to conveniently access the centre.
- Overall, the centre is highly accessible which supports an extended catchment area, particularly to the south and west.

DRIVE-TIME TO KARDINYA PARK ACTIVITY CENTRE



SHOPPING CENTRE COMPOSITION

KEY INSIGHTS

- The Kardinya Park District Centre is currently a relatively small centre focussed on convenience food retail, homewares and specialty uses.
- The Kardinya Park Shopping Centre accommodates much of the retail offering in the activity centre. This centre was developed in 1976 and underwent an expansion in 1999.
- The shopping centre accommodates:
  - A well-performing small-format Coles Supermarket;
  - The only Kmart between Booragoon and Rockingham;
  - Specialty food retail (e.g. small Asian grocer, butcher etc.);
  - Several cafes and take-away / dine-in stores;
  - Mycar (formerly Kmart Tyre & Auto);
  - Numerous retail services; and
  - A low relatively low level of apparel and other retailers.
- A review of the floorspace mix compared to centre averages illustrates that the centre has a relatively low level of floorspace across a range of categories, including food retail, food catering, apparel and homewares, and no mini-majors. The proposed development aligns with these observed gaps.
- Furthermore, according to the Land Use and Employment Survey (DPLH), the mix across the entire activity centre was found to be below average compared to other district centres across Perth (see slide 12).

FLOORSPACE MIX COMPARISON, KARDINYA PARK SHOPPING CENTRE, 2018

	Kardinya Park		Single DDS Based Centres
	GLA (sq.m)	% of Total GLA	GLA (sq.m)
Majors:			
DDS/s	**6,880**	**50%**	**6,458**
Supermarket/s	**2,802**	**21%**	**5,335**
Other Major/s	**0**	**0%**	**100**
Mini Major/s	**0**	**0%**	**1,557**
Retail Specialties:			
Food Retail	960	7%	482
Food Catering	385	3%	772
Apparel	1,017	7%	1,478
Homewares	0	0%	539
Leisure/General	542	4%	655
Retail Services	1,057	8%	644
Total Retail Specialties	**3,961**	**29%**	**4,576**
Total Retail	**13,643**	**100%**	**18,020**

Source: Urbis Retail Benchmarks, Dato Holdings

SHOPPING CENTRE SURVEY

KEY INSIGHTS

- A survey on the shopping habits of residents in the surrounding area was conducted earlier in 2019.
- The survey confirmed that Kardinya Park was a dominant activity centre for residents in the primary catchment, with 62% of respondents identifying it as their primary shopping centre to go to.
- Kmart was stated as a key draw to for both local shoppers in the primary and secondary trade areas, while also being a big attractor for residents outside of the trading area, with 46% of respondents outside of the trade area stating that the presence of the Kmart was the main reason they shopped at Kardinya Park. This confirms that the Kmart provides a key point of difference and helps meet an unmet need particularly in the areas to the west and south.
- Note, the trade area is subsequently re-defined in Section Four based on the input from this survey.

MOST FREQUENTLY VISITED DEPARTMENT STORE (% OF RESPONDENTS), 2019

	NET	Kardinya (Suburb)	Primary Trade Area (excl Kardinya)	Secondary Trade Area (excl. Primary Trade Area)	Outside Secondary Trade Area
Kmart Kardinya (Kardinya Park Shopping Centre)	51%	81%	60%	53%	20%
Kmart Booragoon (Garden City Shopping Centre)	15%	5%	16%	14%	20%
Myer Booragoon (Garden City Shopping Centre)	8%	6%	6%	8%	12%
Big W Cockburn (Cockburn Gateway SC)	7%	3%	3%	6%	14%
Target Bull Creek (Stockland Bull Creek SC)	4%	2%	2%	3%	7%
Big W Spearwood (Phoenix Shopping Centre)	3%	2%	3%	4%	5%
Reject Shop (any store)	2%	0%	1%	2%	3%
Target Fremantle (Adelaide St)	2%	0%	0%	4%	2%
Target Cockburn (Cockburn Gateway SC)	1%	1%	2%	0%	2%
Harvey Norman (any store)	1%	1%	1%	3%	0%
David Jones Booragoon (Garden City Shopping Centre)	1%	0%	1%	0%	2%

Source: Kardinya Park Shopping Centre Area Survey – Close at Hands Consultants, 2019

PROPOSED ACTIVITY CENTRE DEVELOPMENT

KEY INSIGHTS

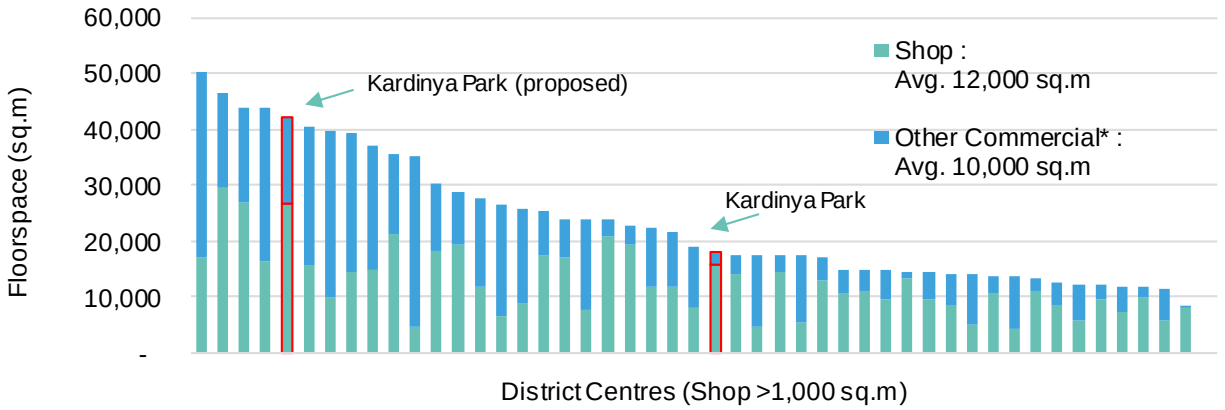
- Stakeholder, customer and community engagement identified the need for a greater range of entertainment, food and beverage and specialty uses in addition to residential development. This engagement informed the development of a redevelopment plan that is expected to include some of the following components:
  - A cinema complex;
  - A food and beverage precinct;
  - A specialty grocer;
  - Additional specialty stores;
  - Private recreation facilities;
  - Medical centre;
  - Gym;
  - Expanded service station and convenience store;
  - Residential apartments; and
  - Re-located Mycar with car wash.
- The volume of floorspace expected to be added to the Activity Centre area outside of the shopping centre is intended to be approximately 7,000sq.m by 2030, with 3,000sq.m being retail floorspace, and 4,000sq.m being non-retail floorspace.
- Following the increase, the activity centre is expected to be below the scale of the larger district centres such as Baldivis and East Victoria Park. Furthermore, the centre is expected to continue to function as a district centre as described in SPP 4.2 Activity Centres in Perth and Peel.

EXISTING AND PROPOSED FLOORSPACE (GLA), KARDINYA PARK SHOPPING CENTRE

	Existing	Proposed	Centre Build Out
	2019	*2022*	*2030*
Shopping Centre	**13,776**	**27,936**	**30,936**
Retail	13,776	21,244	22,244
Non-Retail	0	6,692	8,692
Other ACP	**4,457**	**4,457**	**11,457**
ACP Retail	1,457	1,457	4,457
ACP Non-retail	3,000	3,000	7,000
Total Activity Centre Floorspace	**18,233**	**32,393**	**42,393**
Total Retail Floorspace Assessed	*15,233*	*22,701*	*26,701*

Source: DATO Holdings

DISTRICT CENTRE FLOORSPACE COMPARISON, PERTH, 2015-17



**Other Retail; Entert. / Rec / Cultural; Office / Business; Health / Welfare / Comm.; Service Industry*
Source : Urbis

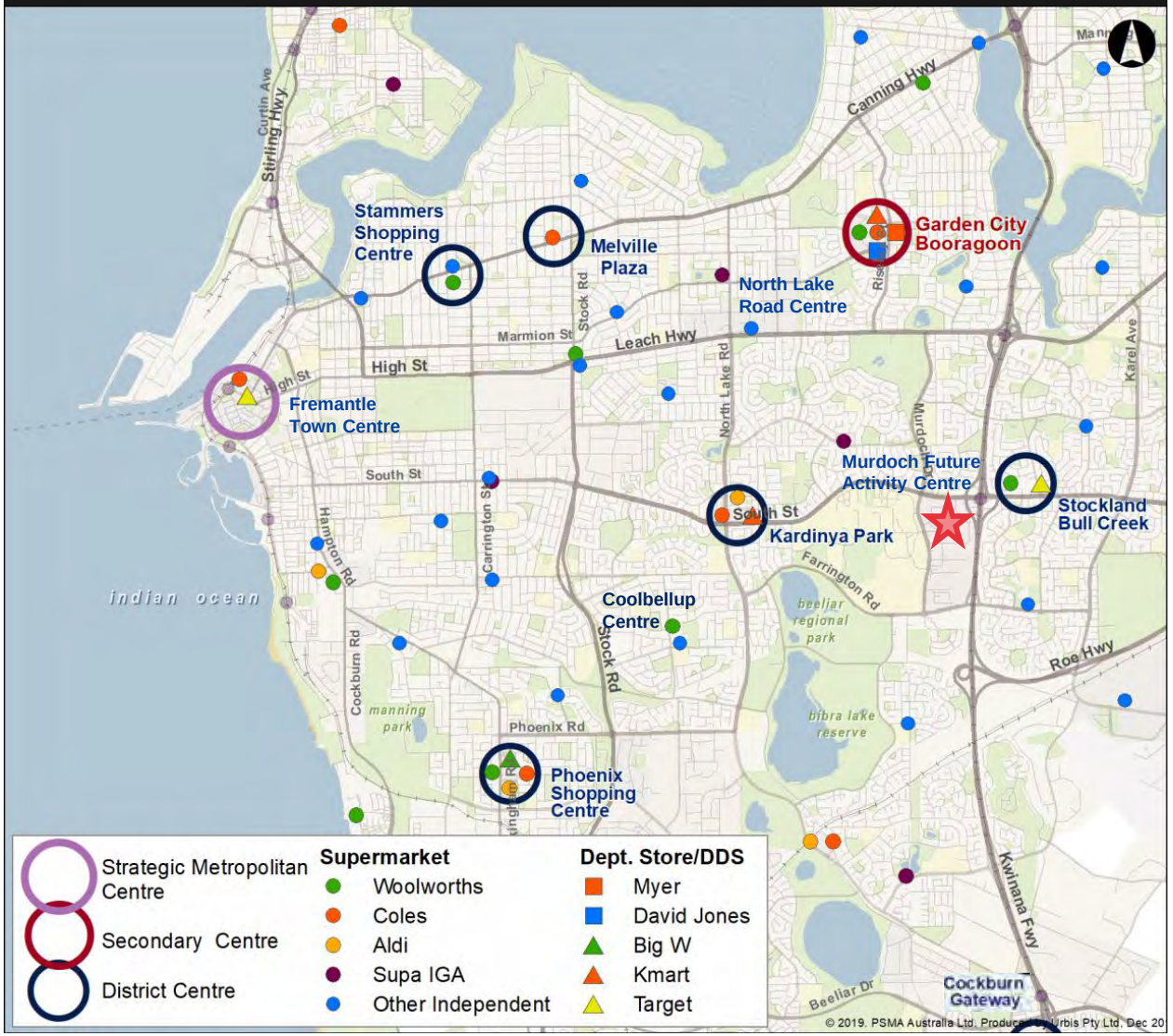
SECTION THREE
LOCAL CONTEXT

COMPETITION

KEY INSIGHTS

- There is an established hierarchy of centres in the wider area which influence the role and viability of the Kardinya Park activity centre. Key findings are noted below.
  - **Higher Order Centres**: There are several significant activity centres within the wider area that play a regional role; namely, Garden City and the Fremantle town centre.
  - **Other District Centres**: Stockland Bull Creek is the most proximate district centre to Kardinya Park. This centre is anchored by a Woolworths and a Target and benefits from a captive catchment that extends eastward. Further south, Phoenix Shopping Centre caters to residents in the growing areas of Coogee and Spearwood. There are limited entertainment and food catering offerings within these centres.
  - **Local and Neighbourhood Centres**: There are numerous supermarket-anchored local and neighbourhood centres in the surrounding area. Proximate full-line supermarket-anchored centres however are limited to the recently expanded Coolbellup Shopping Centre.
- The role and offering of the Garden City secondary centre is expected to limit the draw of Kardinya Park from areas north of Leach Highway. Meanwhile, the Bull Creek and Phoenix district centres will limit the catchment east of Kwinana Freeway and west of Stock Road.
- It should be noted that there is expected to be a substantial volume of floorspace in the Murdoch specialised activity centre area that will be developed over the next two decades.

ACTIVITY CENTRE HIERARCHY



COMPETITION

MAJOR CENTRES

	Distance from Kardinya Park (km)	Year of Refurbishment	Retail GLA	Major Tenants
Strategic Metropolitan Centre				
Fremantle Town Centre	8.1	2019	65,023	Coles, Target
Secondary Centre				
Garden City	5.5	2019	58,615	Myer, David Jones, Coles, Woolworths
Cockburn Gateway	9.7	2015	44,825	Coles, Woolworths,
District Centre				
Stockland Bull Creek	4.3	1996	16,209	Woolworths, Target
Livingston Marketplace	10.8	2004	15,541	Woolworths, Big W
Melville Plaza	6.5	1999	8,627	Coles
Phoenix Shopping Centre	6.5	2009	20,826	Coles, Big W
Stammer's Shopping Centre	7.6	-	8,748	Woolworths

Source: Urbis, PCA Shopping Centres Database, DPLH Perth Land Use and Employment Survey 2015/17

COMPETITION

KEY INSIGHTS

- The existing hierarchy has been established for more than four decades and there has been limited expansion of retail floorspace in the area; particularly over the past two decades. There are however several key retail expansions which have implications for the proposed expansion at Kardinya Park. The key developments assumed are noted in the table and summarised below.
  - **Garden City**: AMP recently sold a 50% stake in the Garden City Shopping Centre to Scentre Group. As such, existing expansion plans are likely to change and / or be delayed and therefore this assessment assumed the expansion would be complete by 2024.
  - **Fremantle Town Centre**: The King's Square development is expected to add retail floorspace to Fremantle by 2021. The Woolstores centre is expected to bring an additional supermarket to the town centre and additional retail specialties (this redevelopment is proposed to significantly decrease the size of the discount department store).
  - **Davis Park, Beaconsfield**: A draft structure plan indicates an expansion of the Fifth Avenue Activity Centre could form part of the initial stages of this infill development. The proposed expansion is assumed to be complete by 2023.
  - **Murdoch Specialised Activity Centre**: Retail floorspace as part of the development of the Murdoch specialised activity centre is set to take place over the next 15-20 years, in line with the likely development timeframes of the commercial floorspace. We have assumed an initial retail development by 2023, and a portion of total development to be operational by 2030.

KEY PLANNED DEVELOPMENTS

Development	Impact Year	Description	Floorspace Expansion
Garden City Booragoon	2024	Prior to the part sale to Scentre Group. AMP progressed with plans to redevelop Garden City.	4,000sq.m Department Store, 6,000sq.m DDS, 7,500sq.m Supermarket, 5,000sq.m Mini-majors, 17,500sq.m Total Retail Specialties
Woolstores Shopping Centre Development	2025	The application proposes to redevelop the existing Woolstores Shopping Centre and to construct a new six (6) level mixed use building at 28 (Lot 1) Cantonment Street Fremantle	3,400sq.m Supermarket, 3,277 sq.m Retail Specialties, removal of Department Store and Discount Department Store
The Heart of Beaconsfield	2023	Expansion of beaconsfield local centre to include a supermarket, and specialties	2,800sq.m Supermarket, 1,800sq.m Retail Specialties
King's Square Fremantle (FOMO)	2021	Redevelopment of King's square to offer additional office and retail floorspace, focussed on creating a food and beverage precinct.	20,800sq.m of office space, 5,500sq.m retail floorspace
Murdoch Mixed-Use Precinct Retail Centre	2023	Initial retail development as part of the Murdoch Specialised Activity Centre to include 2 convenience focussed supermarket centres	3,000sq.m supermarket, 206sq.m food retail, 779sq.m food catering, 667sq.m general retail, 320sq.m retail services, and 300sq.m of non-retail floorspace
Murdoch Specialised Activity Centre	2030+	Development includes the remainder of Murdoch specialised activity centre retail floorspace (total of 29,755 minus the Mixed-use retail precinct) set to be developed within the core of the precinct, totalling 24,484sq.m.	We have estimated that 12,242sq.m (50%) of floorspace would be developed by 2030.

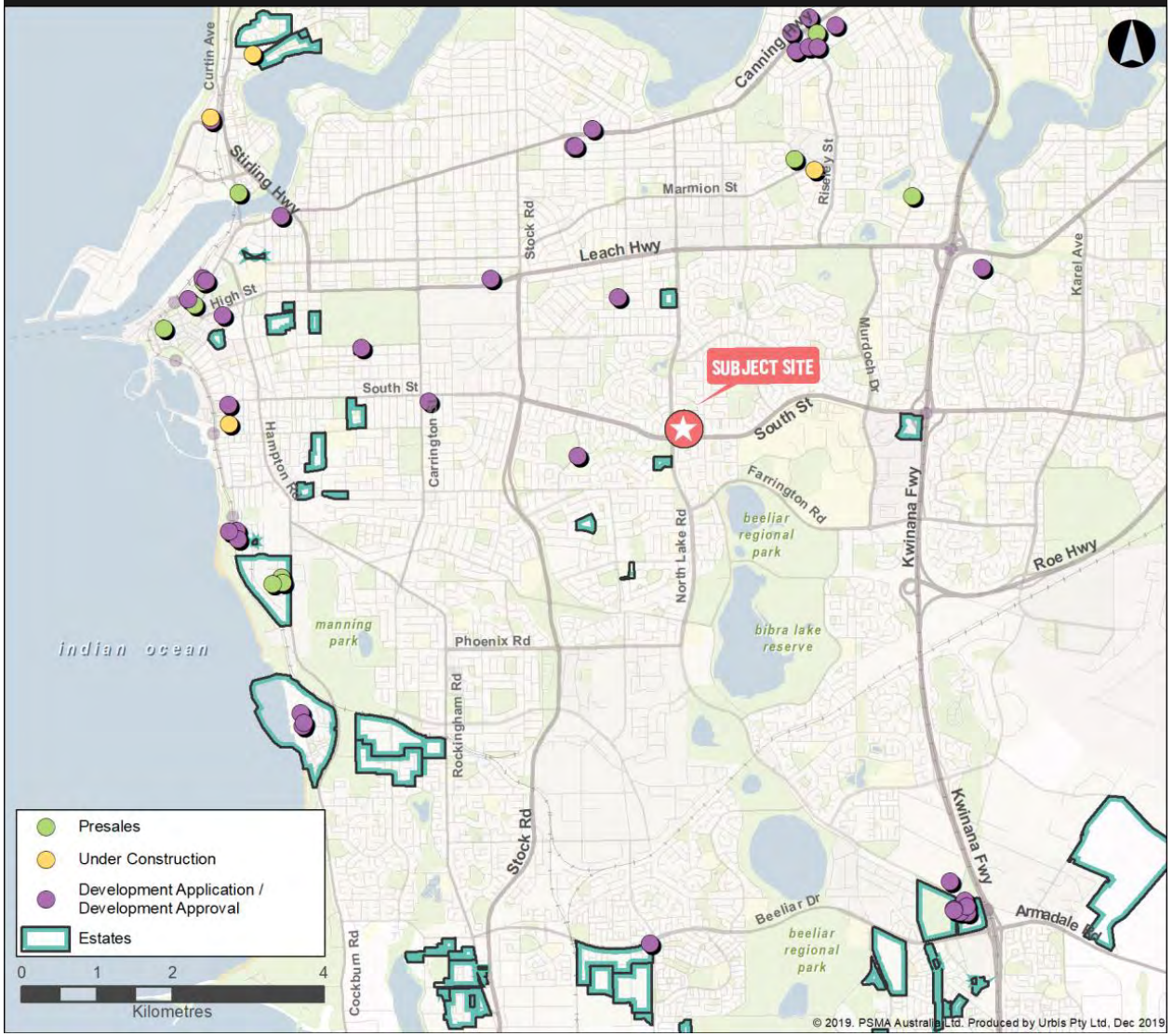
Source: Urbis, Cordell Connect

DEVELOPMENT CONTEXT

KEY INSIGHTS

- Kardinya and the immediately adjacent suburbs are relatively low density urban areas which developed in the 1960s and 1970s. Re-zoning and state and local government focus on infill development however is driving increased development activity and population growth.
- Several key infill developments of relevance are noted below.
  - **Kardinya Heights**: This infill development is approximately 70% sold and expected to accommodate 300 residents at build-out.
  - **Murdoch Health and Knowledge Precinct**: This long term State Government-led development is expected to accommodate apartments, student housing, aged care, local convenience retail, office and further health services.
  - **Gallery (Carawatha)**: The existing public open space along North Lake Road (2km north of Kardinya Park) is currently under development, with the first lots expected to be developed in 2020. This development is expected to accommodate approximately 250 residents at build-out.
- There area a number of active and pending apartment developments (minimum 25 apartments) in the broader area. The near term outlook for apartment development in the immediate area of the centre is however limited by current zoning.
- These infill developments are expected to support near term population growth and spending at the Kardinya Park Shopping Centre.

INFILL PRECINCT MAP



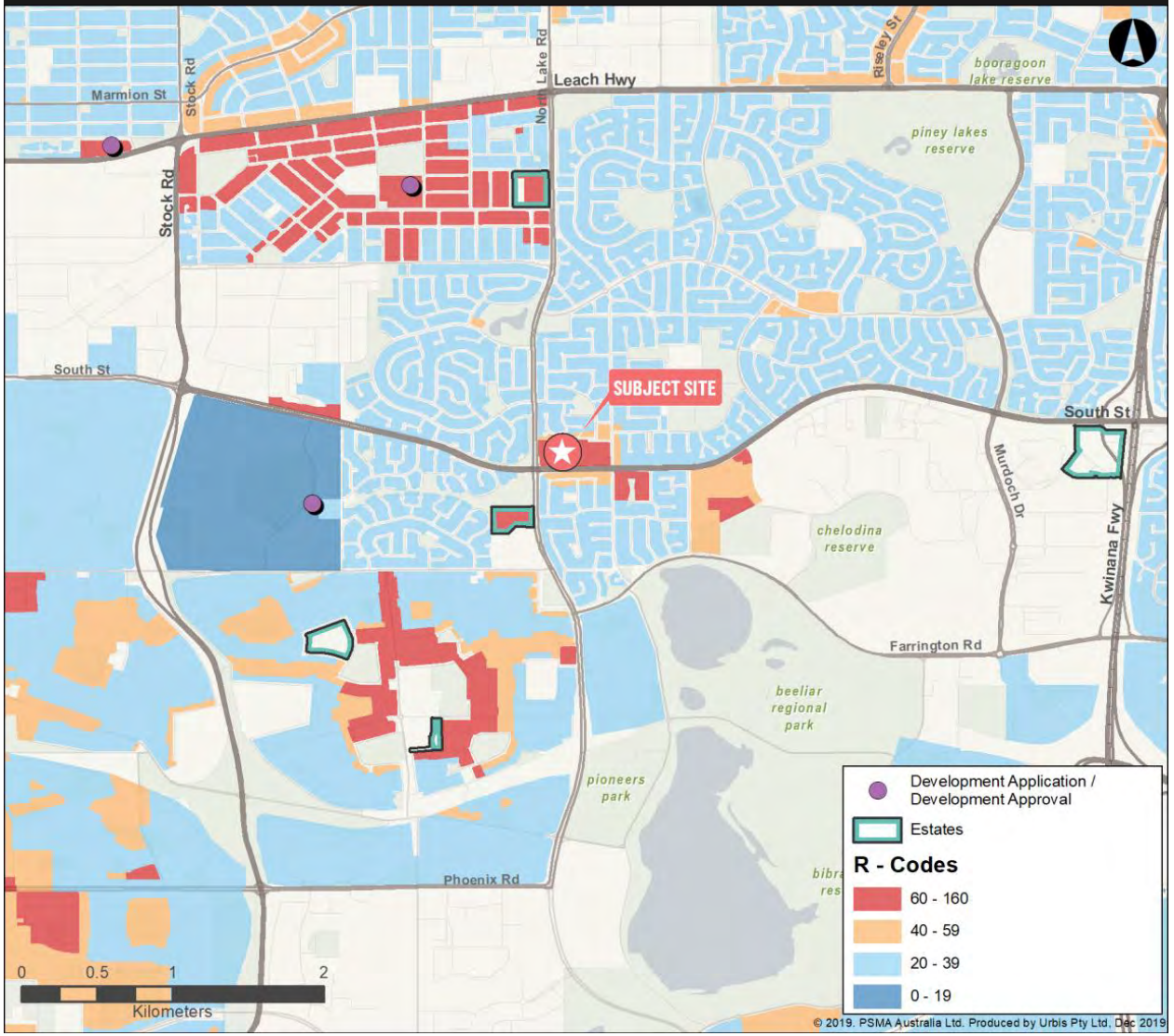
Source: Urbis

DEVELOPMENT CONTEXT

KEY INSIGHTS

- Re-zoning of areas surrounding Kardinya Park is supporting small scale sub-divisions and unit development.
- The City of Cockburn increased zoning in the Coolbellup suburb and this is supporting low rise apartment / unit development, townhouses and sub-divisions. As a result, .id Consulting forecasts developed for the City show that this area is expected to see its population increase 60.9% between 2019 and 2041.
- The City of Melville increased zoning in the north of Willagee and this is supporting increased development alongside the Carawatha development. Forecasts developed for the City of Melville show that this suburb is expected to see its population increase 53.7% between 2019 and 2036.
- Within the suburb of Kardinya, zoning supports moderate sub-division of existing large lots. Whilst the level of development based on current zoning is limited in the near term, the suburb is expected to experience moderate population growth as a result. Forecasts developed for the City of Melville show that this area is expected to see its population increase 13% between 2019 and 2036.
- 51ha of land surrounding the activity centre is expected to see a zoning increase with the adoption of the ACP, which will be equivalent to approximately 1,216 net dwellings being added to the primary catchment of the centre (at a 50% uptake rate), which is broadly equivalent to 3,040 additional residents in the primary catchment when the development is realised.

RESIDENTIAL ZONING MAP



Source: Urbis, DPLH, Local Schemes

STUDENT/WORKER CATCHMENT

KEY INSIGHTS

- In addition to the resident catchment, Kardinya Park benefits from proximity to Murdoch University, the Murdoch Health and Knowledge Precinct and numerous service industry and industrial areas such as Bibra Lake and O'Connor.
- There are estimated to be approximately 24,000 students enrolled at Murdoch University, with the vast majority studying at the South Street campus. Murdoch University is increasing its efforts to attract international students and is expected to continue to support increased student numbers over the coming years.
- There are number of key employment precincts in the wider area that accommodated an estimated 57,500 workers in 2016.

STUDENT ENROLMENTS, MURDOCH UNIVERSITY, 2001-18

Source: Murdoch University Annual Reports, 2001-2018

ESTIMATED JOBS BY AREA, 2016

Region	Workers
Fremantle	16,587
Booragoon	7,109
Murdoch - Kardinya	13,618
Bibra Industrial	8,988
O'Connor (WA)	4,338
Melville	6,902

Source: ABS Census of Population and Housing, 2016

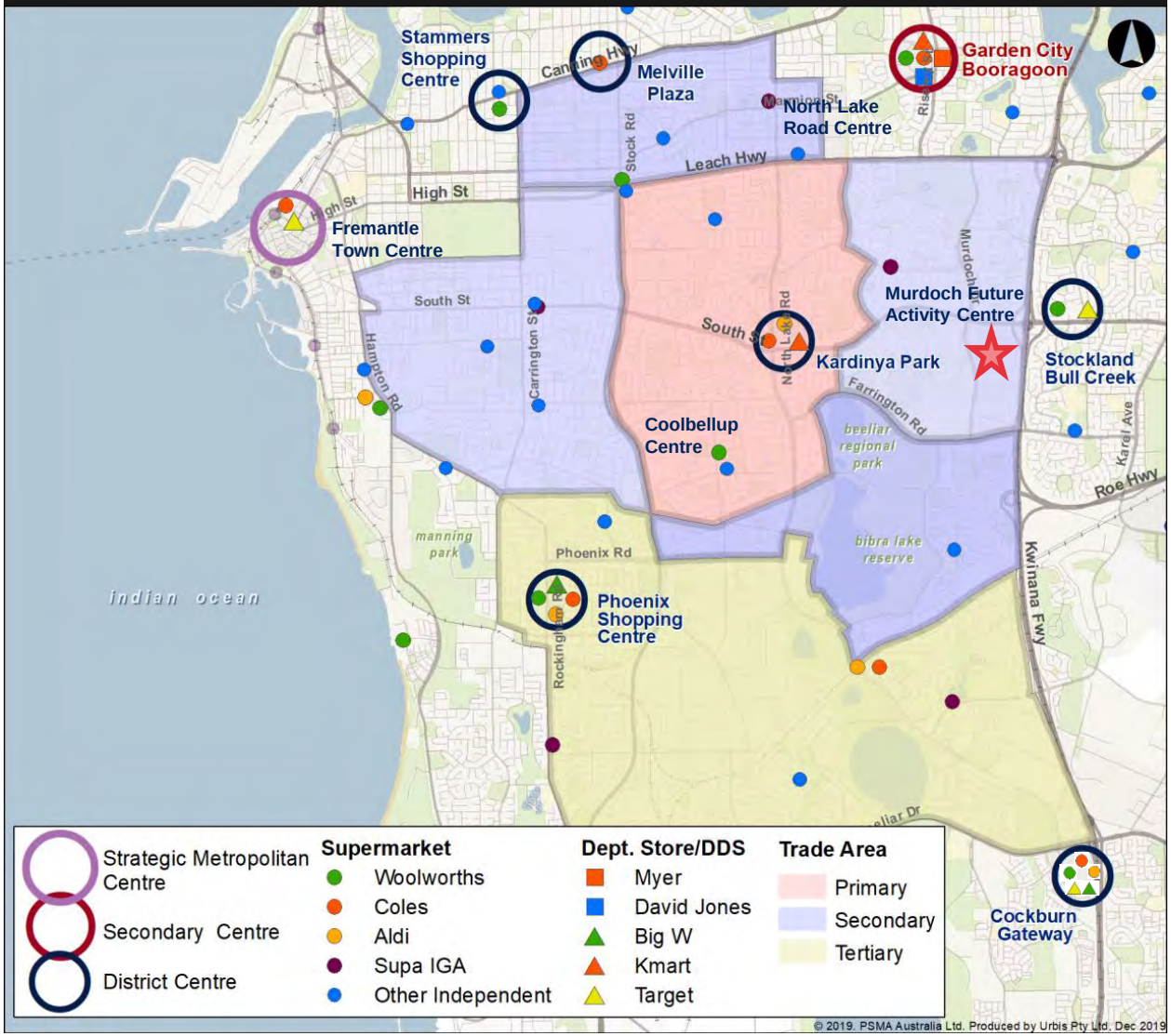
SECTION THREE
TRADE AREA PROFILE

TRADE AREA DEFINITION

KEY INSIGHTS

- The defined trade area for Kardinya Park was based on:
  - The supply and mix of retail at the Kardinya Park activity centre and at surrounding centres;
  - The accessibility of the centre compared to other centres;
  - Physical barriers that may limit access (such as Kwinana Freeway);
  - Surveying of residents in surrounding areas; and
  - Previously defined trade areas for this centre.
- Limited comparable offerings to the west and accessibility along South Street suggest that the centre services residents located in suburbs to the west such as Beaconsfield and Hilton. This is confirmed by the resident survey which demonstrated that the centre is well used by residents in this trade area.
- Whilst the centre is easily accessible to areas to the east, its catchment is expected to be limited by the offering at Stockland Bull Creek.
- A secondary north trade area was defined for the parts of Melville and Palmyra located north of Leach Highway to reflect the accessibility of the centre. The market shares for this trade area are however expected to be relatively low.
- A tertiary trade area has been defined to the south. This tertiary trade area was defined based on relatively high usage noted in the resident survey (primarily driven by the Kmart offering – the only Kmart between Booragoon and Rockingham) and accessibility via North Lake and Stock Roads (on average, the drivetime is less than 10 minutes for residents in this trade area).

TRADE AREA, KARDINYA PARK ACTIVITY CENTRE



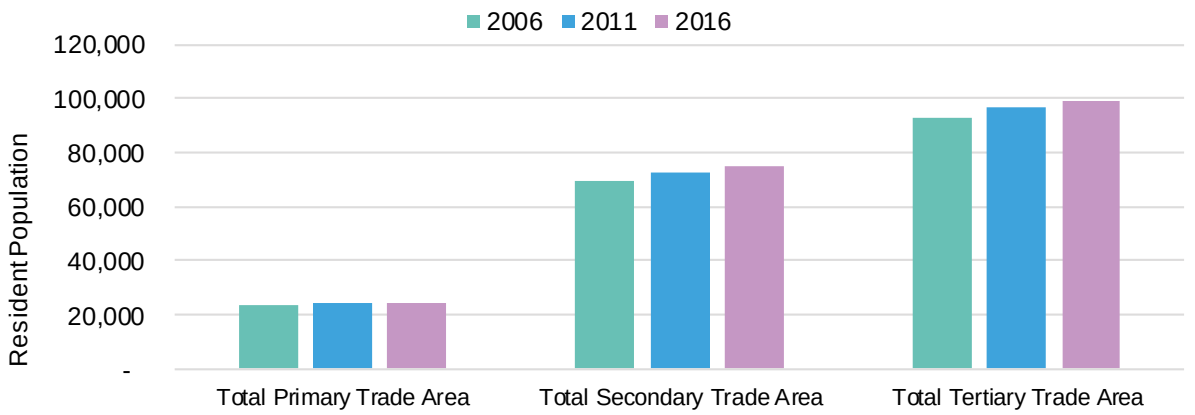
Source: Urbis

RESIDENT POPULATION

KEY INSIGHTS

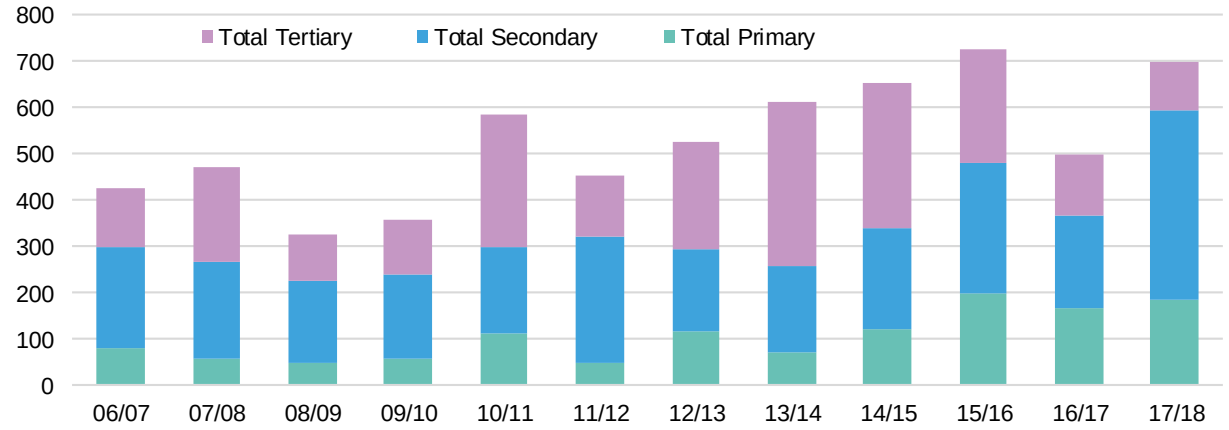
- The aforementioned infill developments and re-zoning has supported notable population growth over the past decade.
- The estimated resident population within the main trade area grew by 8.4% from 2006 to 2016. A more recent decline in population was influenced by inflated rental vacancies which were above 5% in 2017 in the surrounding area (defined as postcode 6163). The vacancy rate as of September 2019 had declined to 2.0%.
- The population in the trade area is expected to continue to grow in the near term as a result of building activity equivalent to approximately 700 dwelling approvals in 2017/18, including approximately 200 dwelling approvals within the primary trade area.

HISTORICAL POPULATION GROWTH, TRADE AREA



Source: ABS

DWELLING APPROVALS, TRADE AREA, 2006-18



Source: ABS

RESIDENT POPULATION

KEY INSIGHTS

- The forecast resident population in the trade area is based on the following information.
  - The latest Estimated Resident Population (ERP) figures to June 2018 (released by the ABS). This latest data is provided at a Statistical Area 1 (SA1) geography level, thus providing an accurate estimate of resident population for the trade area.
  - New dwelling approvals data prepared by the ABS to June 2018. This data provides an indication of potential short term dwelling development activity and resident population growth.
  - Small Area Forecast Information (SAFI) prepared by .id Consulting (which also supplies population forecasts to the City of Melville.
  - A review and analysis of current and proposed residential developments in the catchment area, including the zoning increase in the ACP area.
- Currently (at June 2018) the main trade area's population is estimated at approximately 78,430 people. As noted above, the resident population was estimated to have declined primarily due to inflated rental vacancy rates which have subsequently declined by three percentage points over the past two years in the Kardinya area (according to SQM Research). The rental vacancy decline alone is estimated to equate to approximately 250 dwellings in the main trade area.
- Moderate population growth is assumed over the 2018-23 period equivalent to 542 residents per annum. This is expected to be supported by growth within the primary catchment in developments such as Gallery and small-scale developments in the suburb of Coolbellup and Willagee. The Secondary West trade area is also expected to have notable growth supported by infill developments.

RESIDENT POPULATION GROWTH

	2013	2018	2023	2028	13-18	18-23	23-28
Primary:							
Primary	25,940	25,250	26,460	28,360	-138	242	380
Secondary:							
East	11,480	10,930	11,560	12,770	-110	126	242
North	15,190	15,250	15,480	15,650	12	46	34
West	20,160	20,380	21,370	22,470	44	198	220
South	6,850	6,620	6,650	6,800	-46	6	30
Total Secondary	**53,680**	**53,180**	**55,060**	**57,690**	**-100**	**376**	**526**
Main Trade Area	**79,620**	**78,430**	**81,520**	**86,050**	**-238**	**618**	**906**
Tertiary:							
South	27,160	27,520	30,180	33,930	72	532	750
Total Trade Area	**106,780**	**105,950**	**111,700**	**119,980**	**-166**	**1,150**	**1,656**

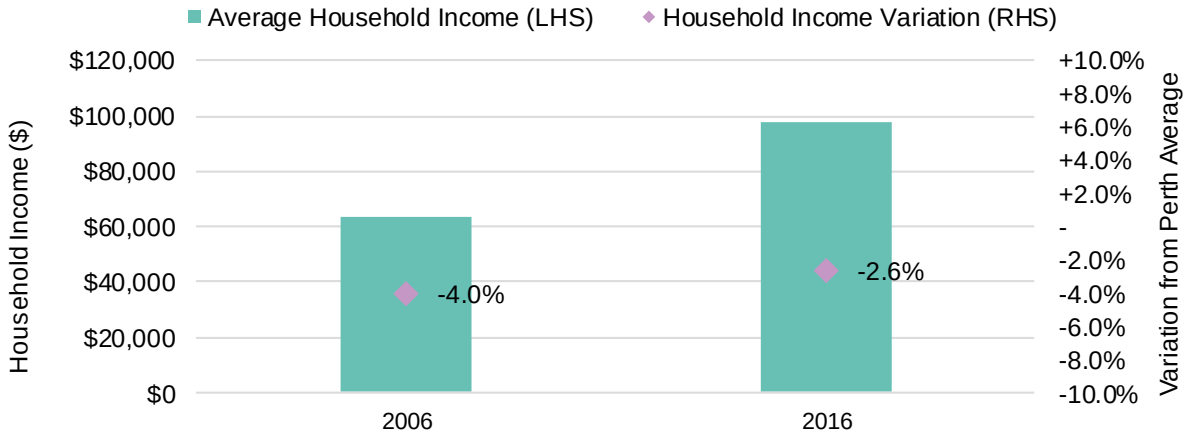
Source: Urbis, SAFi, ABS

RESIDENT ATTRIBUTES

KEY INSIGHTS

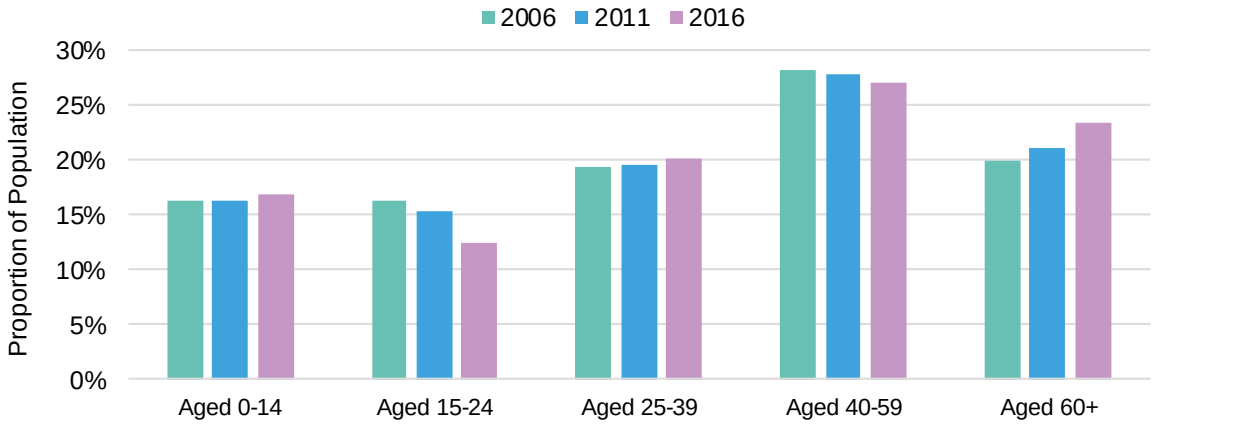
- Residents in the catchment have become more affluent in the period from 2006 to 2016. Over this period, the average household income in the Kardinya main trade area increased at a substantial rate – growing from $62,000 to $97,000 (an increase of 56%). The variance from the Perth average also declined from being 4% below the Perth average in 2006 to being 2.6% below in 2016.
- The age profile of residents in the catchment changed substantially from 2006 to 2016, with the proportion of residents aged over 60 increasing substantially while the proportion of young adult residents aged between 15-24 declined.

CHANGE IN INCOME, 2006-2016, TRADE AREA



Source: ABS Census of Population and Housing

CHANGE IN AGE PROFILE, 2006-2016, TRADE AREA



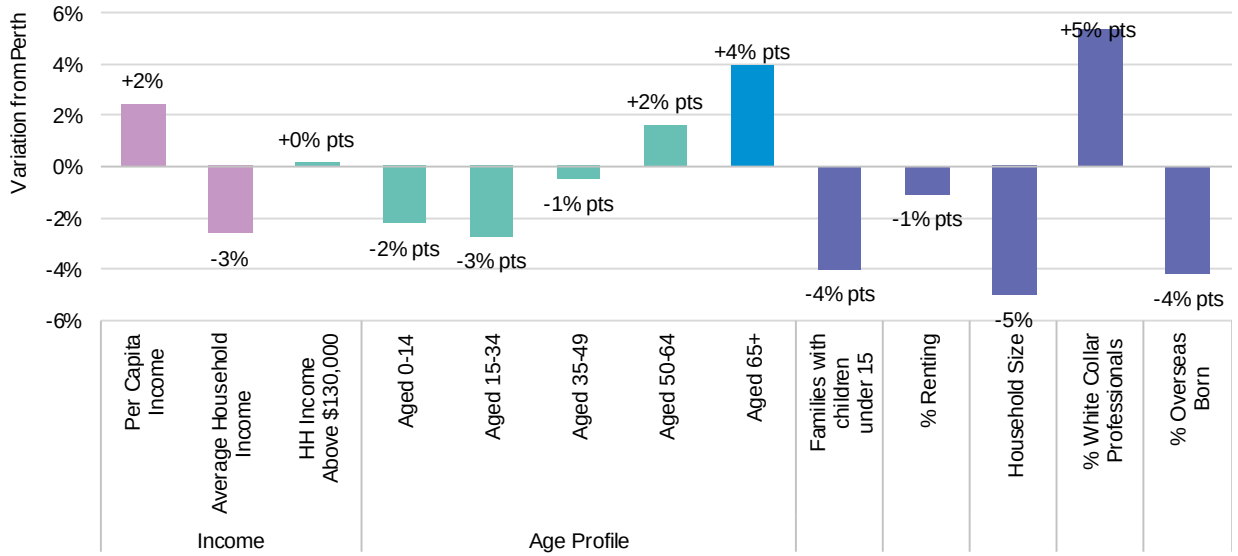
Source: ABS Census of Population and Housing

RESIDENT ATTRIBUTES

KEY INSIGHTS

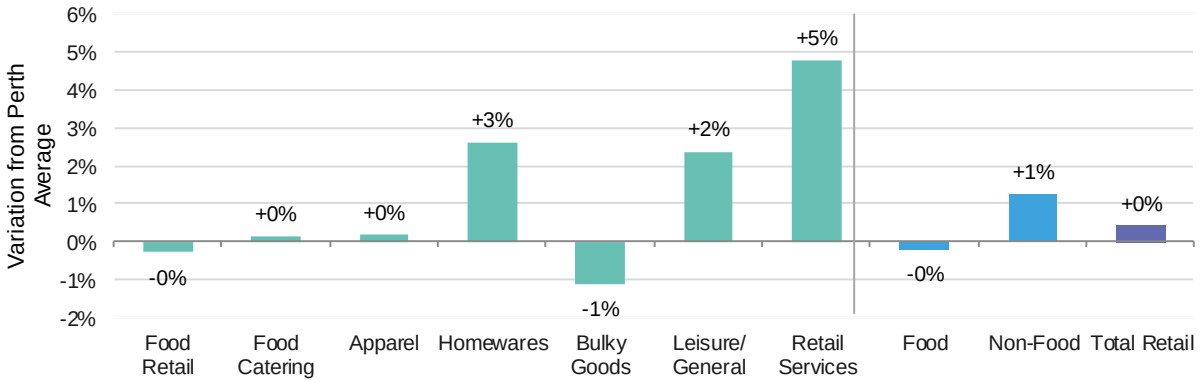
- The level of future expenditure and retail demand in the trade area will be influenced by the socio-economic profile of current and future residents.
- Based on data from the 2016 Census of Population and Housing, the demographics of the catchment area reflect the established nature of the area with a high representation of older residents and lower representation of young families.
- Trade area residents are estimated to have moderately above average retail expenditure compared to the metropolitan Perth average (0.5% above). There is estimated to be a particularly higher level of spending on retail services (e.g. hairdressers, nail salons) and leisure and homewares goods and services.
- The retail spending market was estimated using MarketInfo – a micro-simulation model developed by MDS Market Data Systems Pty Ltd. This model is based on information from the ABS' Household Expenditure Survey (HES), the Census of Population and Housing and other information sources that provide up-to-date information on changes in spending behaviour and/or income levels (e.g. Australian National Accounts, Australian Taxation Statistics, etc.). MarketInfo is used widely by stakeholders in the retail industry and by other consultants preparing Retail Sustainability Assessments/Economic Impact Assessments.
- The model uses micro-simulation techniques to combine propensity to spend on particular commodities with the socio-economic characteristics of individuals to derive spending per capita estimates on a small area basis (i.e. the Statistical Area 1 level).

KEY DEMOGRAPHIC CHARACTERISTICS, MAIN TRADE AREA RESIDENTS



Source: ABS, Urbis

EXPENDITURE PER CAPITA VARIATION, MAIN TRADE AREA RESIDENTS



Source: ABS, Urbis

RESIDENT EXPENDITURE

KEY INSIGHTS

- The current and forecast annual retail spend generated by residents in the trade area was estimated. In the year to June 2018, retail expenditure was estimated at $1,375 million in the main trade area.
- The forecast growth in retail expenditure by trade area residents was influenced by the following assumptions and inputs.
  - Forecast population growth outlined above (e.g. ~0.8% per annum over 2018-23 period in the main trade area).
  - Retail spend per capita of 0.4% p.a. and 0.9% p.a. over the 2018-23 and 2023-28 periods respectively. The forecasts allow for lower growth in the short term in line with the current softer economic environment and the expectation for more normalised growth (particularly wages growth) from 2023 onwards. Growth rate assumptions vary across retail categories, with growth rates forecast to be strongest for food retail and food catering over the 2013-28 period.
  - No allowance for future inflation, with future spending expressed in constant 2018 dollar terms.
- Over the five years to 2023, annual retail expenditure generated by residents in the main trade area is forecast to increase by an average of $14 million p.a. (1.2% p.a.). With population growth forecast to increase after 2023, expenditure is forecast to increase at a rate of $26 million p.a. in the five years to 2028.

ESTIMATED RETAIL SPENDING BY PRODUCT GROUP ($2018), TRADE AREA

	Food Retail	Food Catering	Apparel	Home-w ares	Bulky Goods	Leisure/ General	Retail Services	**Total Retail**	*Annual Growth*	= *Pop Growth*	+ *Per Cap Spend Growth*
Primary Trade Area:											
2013	165	42	36	28	43	43	14	**371**			
2018	172	42	33	25	38	44	13	**369**	*-0.1%*	*-0.5%*	*0.4%*
2023	183	45	36	27	41	48	14	**394**	*1.3%*	*0.9%*	*0.4%*
2028	203	52	41	31	47	54	16	**442**	*2.3%*	*1.4%*	*0.9%*
Main Trade Area:											
2013	512	132	114	90	139	137	46	**1,171**			
2018	540	135	108	81	124	144	44	**1,176**	*0.1%*	*-0.3%*	*0.4%*
2023	570	144	114	87	132	153	47	**1,247**	*1.2%*	*0.8%*	*0.4%*
2028	620	161	127	98	147	170	51	**1,375**	*2.0%*	*1.1%*	*0.9%*
Total Trade Area:											
2013	685	171	147	116	180	177	59	**1,536**			
2018	728	176	139	105	163	188	56	**1,555**	*0.2%*	*-0.2%*	*0.4%*
2023	779	191	149	114	175	202	60	**1,670**	*1.4%*	*1.1%*	*0.4%*
2028	863	217	169	130	198	229	67	**1,873**	*2.3%*	*1.4%*	*0.9%*

Source: Urbis, Marketinfo, ABS

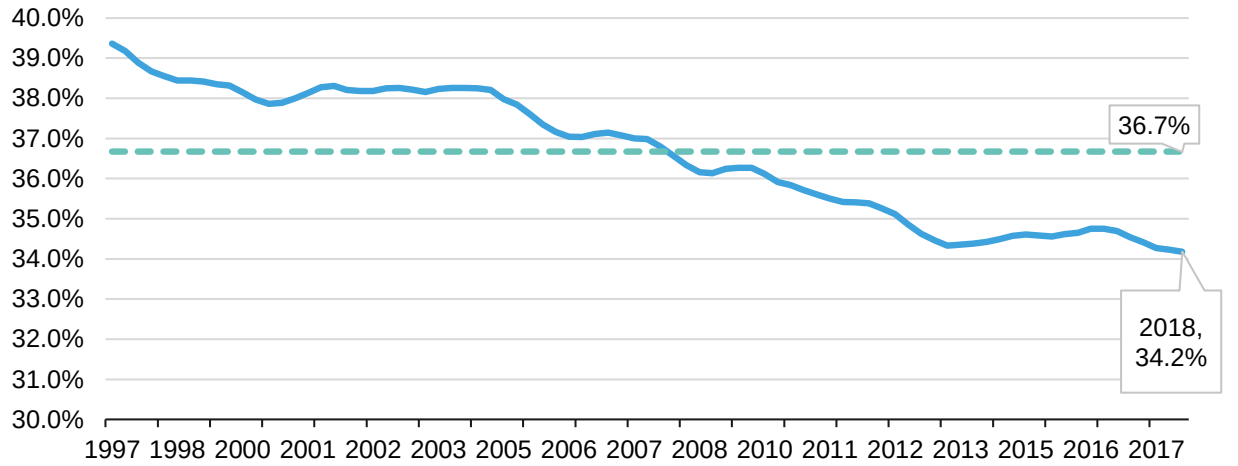
SECTION FOUR
NEEDS ASSESSMENT

CONSUMER SPENDING

KEY INSIGHTS

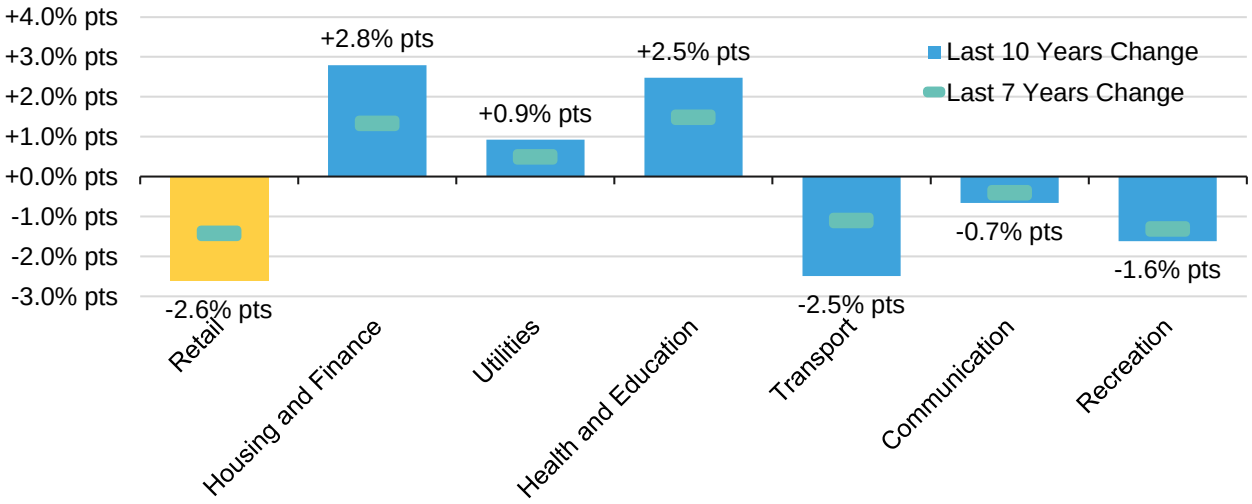
- Retail is a rapidly evolving sector and a key driver of this change is consumer spending patterns.
- Influenced by economic, social, technology and other factors, the overall share of household spending to retail declined by approximately 6 percentage points over the past two decades.
- Private schooling, health, mortgages, electricity prices and other costs now consume a much greater share of household budgets. This is a trend that has played out nationally and within Perth.
- A further influencing factor has been deflation within certain retail categories which has been influenced by price competition and import markets.
- Overall, the reduced share of spending to retail is driving a need for centres to truly re-position as activity centres with a diverse range of uses.

RETAIL SHARE OF HOUSEHOLD SPENDING, AUSTRALIA, 1997-2018



Source: Urbis, ABS

HOUSEHOLD SPENDING CHANGE BY CATEGORY, AUSTRALIA, 2018



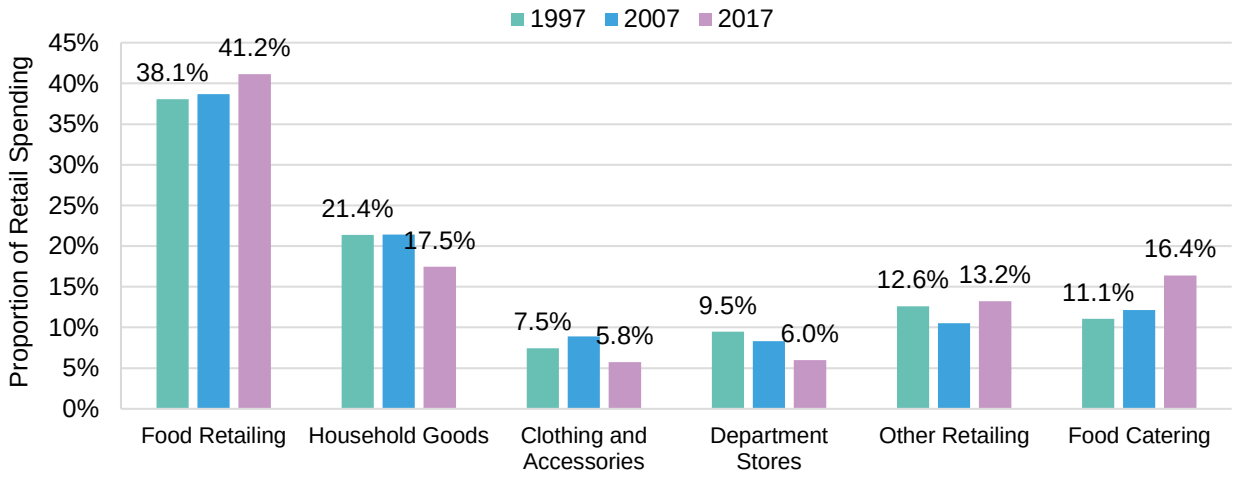
Source: Urbis, ABS

CONSUMER SPENDING

KEY INSIGHTS

- Within the retail spending market, there are mixed fortunes across retail categories.
- Of note to the expansion proposal for Kardinya Park, consumers are prioritising food and dining with spending increasing at above average rates for this category at the expense of apparel categories.
- Categories such as apparel are being particularly influenced also by online spending which has created a greater imperative for centres to diversify tenancies.
- As a result in the significant shift in retail expenditure, retail gaps have emerged in established markets across the country. This is relevant for Kardinya Park and the established retail hierarchy which to date is based primarily on a mix of retail that was appropriate two decades ago.

RETAIL SPENDING SHARES BY CATEGORY, WESTERN AUSTRALIA



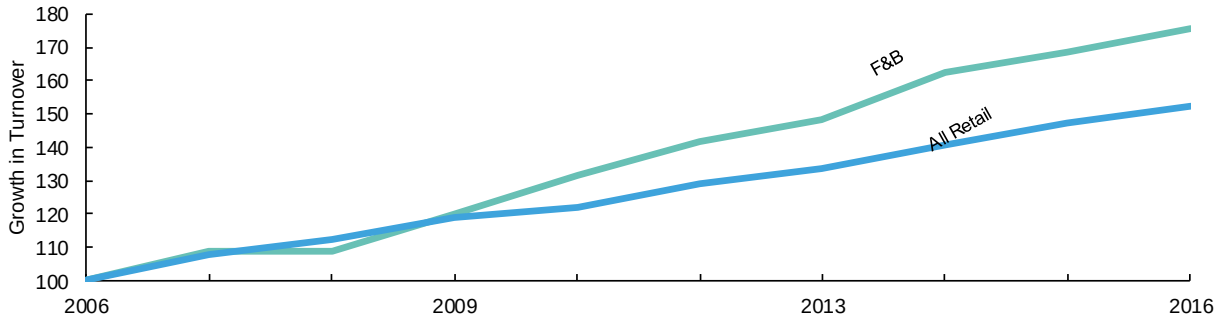
Source: Urbis, ABS

CONSUMER SPENDING

KEY INSIGHTS

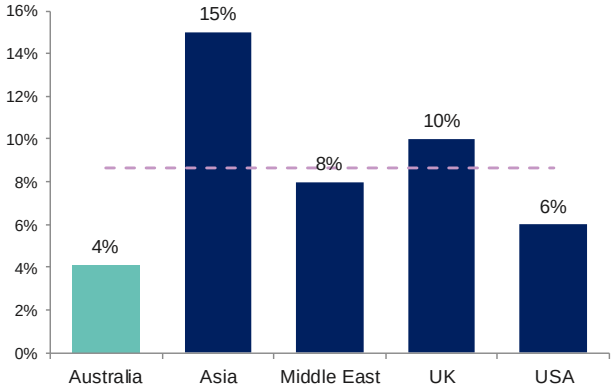
- Urbis has completed research on the importance of entertainment and leisure precincts at centres to remain relevant.
- Food and beverage turnover for centres has been growing at a faster rate than the turnover growth rate for retail in general in the period from 2006 to 2016. This growth has begun to be met by expanding food and beverage options at large regional centres, but has not been pursued by smaller centres as aggressively.
- Internationally, Australian retail centres fall behind their international counterparts in terms of the proportion of food and beverage floorspace. Given that Asian retail centres have food and beverage floorspace accounting for 15% of total retail floorspace, the potential opportunity being missed by Australian centres is considerable.

GROWTH IN SHOPPING CENTRE TURNOVER, AUSTRALIA, 2006-16

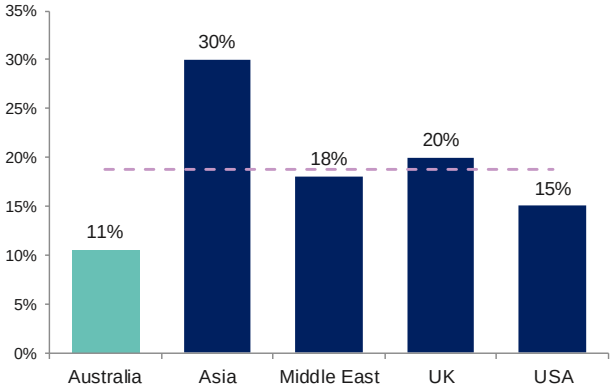


Source: Urbis

CENTRE F&B FLOORSPACE (% OF TOTAL)



CENTRE F&B FLOORSPACE (% OF SPECIALTY)



Source: Urbis
n.b. F&B excludes supermarket and grocer turnover

FUTURE RETAIL MARKET

KEY INSIGHTS

- The main trade area will eventually accommodate upwards of 86,050 residents by 2028 which would generate over $1.38 billion in retail expenditure (in 2018 dollar terms). This market size will support a range of additional supermarkets, convenience based retailing, food catering tenancies, homewares and apparel retailers, non-retail services, and entertainment, commercial and community facilities.
- Kardinya Park will need to play a role in providing shops and facilities that adequately address the requirements of residents within the trade area, students and workers.
- An estimate of indicative supportable floorspace for relevant PLUC 5 (shop retail) was undertaken based on retail expenditure forecasts and the application of average sales densities informed by the Urbis Shopping Centre Benchmarks survey. The analysis found that the quantum of supportable floorspace is expected to increases significantly across a range of categories.
  - Food catering – up 4,200 sq.m over 2013-28 period in the total trade area.
  - Leisure / general – up 8,500sq.m over 2013-28 period in the total trade area.
  - Food Retail – up 18,600sq.m over 2013-28 period in the total trade area.

SUPPORTABLE FLOORSPACE CAPACITY (SQ.M GLA)

	Food Retail	Food Catering	Apparel	Home-wares	Leisure/ General	Retail Services	**Total Retail**
Primary Trade Area:							
2013	17,407	5,962	10,270	5,570	7,124	2,355	**48,688**
2018	18,139	6,033	9,556	4,933	7,409	2,225	**48,295**
2023	19,297	6,486	10,242	5,337	7,941	2,370	**51,673**
2028	21,343	7,369	11,584	6,117	8,981	2,656	**58,050**
Main Trade Area:							
2013	53,927	18,810	32,667	18,061	22,813	7,703	**153,980**
2018	56,882	19,250	30,725	16,184	24,010	7,364	**154,415**
2023	60,003	20,523	32,652	17,363	25,511	7,775	**163,827**
2028	65,312	22,961	36,374	19,594	28,392	8,575	**181,208**
Total Trade Area:							
2013	72,151	24,457	41,921	23,217	29,567	9,766	**201,080**
2018	76,644	25,196	39,686	20,935	31,320	9,392	**203,173**
2023	82,009	27,215	42,705	22,744	33,713	10,036	**218,423**
2028	90,844	30,935	48,301	26,063	38,122	11,233	**245,498**

Source: Urbis

CINEMA CAPACITY

KEY INSIGHTS

- Our assessment of cinema capacity within the total trade area suggests that approximately 10 screens could currently be supported in the trading area.
- While there are no cinemas within the trade area itself, the 8-screen cinema complex at Hoyts Garden City, and the 4-screen complex at Hoyts Fremantle would currently be catering to part of this demand within the trade area
- Given that the catchment for this cinema would extend further south than the trade area for the retail centre does (there are no cinemas to the south before Rockingham) there is likely capacity for a 6-7 screen cinema offering integrated into the food and beverage precinct.

CINEMA CAPACITY ANALYSIS

	2018	2023	2028	2033
Trade Area Population	105,950	111,700	119,980	126,684
Australia Capital City Average Per 100k People	*9*	*9*	*9*	*9*
Supportable Screens	9.5	10.1	10.8	11.4

Source: Urbis

SECTION FIVE
IMPACT ASSESSMENT

IMPACT ASSESSMENT METHODOLOGY

Impact Assessment Overview

An impact assessment is expected to provide an indication of the trading environment and average trading conditions within which retailers operate, and implications for likely turnover declines or gains on average for the retailers involved.

Key Assumptions of an Assessment

Because an impact assessment forecasts how groups of people are likely to alter their shopping behaviour in response to a given change in the competitive environment, it is not possible to estimate individual retailer impacts or each group of retailers in each location.

Therefore in any impact assessment of this type it is not possible to estimate impacts on any specific individual retailer. The impact on any one individual retailer or any small group of retailers in a given location would depend on many factors (e.g. retailer profitability), some of which are within their control. The actions which each of these retailers take will determine the eventual impact on each, and furthermore the actions which they each take will also determine the eventual impact on the other retailers involved.

All of these factors need to be kept in mind when considering the likely impact of any relocation and expansion of a retailer within the existing retail network. Existing retailers are not passive participants but rather will play a major role in the eventual impact which they will experience.

Shopper behaviour is related to the satisfaction of particular requirements. Decisions made regarding where to shop are based on a number of judgements, including relative accessibility, availability of particular retailers, convenience, variety, carparking and others. As a result, residents like to spread their purchases across a wide variety of shopping centres and areas, and use the full range of facilities available to satisfy particular needs.

The method of analysis used to assess the impacts on individual centres from a retail development is based on a 'competitive usage' model. This model is based on the principle that if shoppers choose to direct some of their retail expenditure to the subject development proposal, then they will reduce their expenditure at other centres in a similar proportion to their usage of each centre or location (reflected by each centre's market share from the various trade area sectors). In assessing the potential impacts on other centres in the hierarchy we have adopted a 'turnover allocation approach'.

The assessment of impacts on specific retail centres relies upon an understanding of the existing turnover and level of usage of centres in the trade area and beyond. The model estimates the degree to which various shopping locations within and beyond the trade area are used for retail shopping, by allocating a proportion of turnover to each trade area sector (i.e. source of sales). These estimates result in market share calculations for each competitive centre, and thereby form the basis of which the impact of the proposed retail development is distributed to all other centres used by residents of the trade area for retail shopping. This is commonly referred to as the 'one-off' impact.

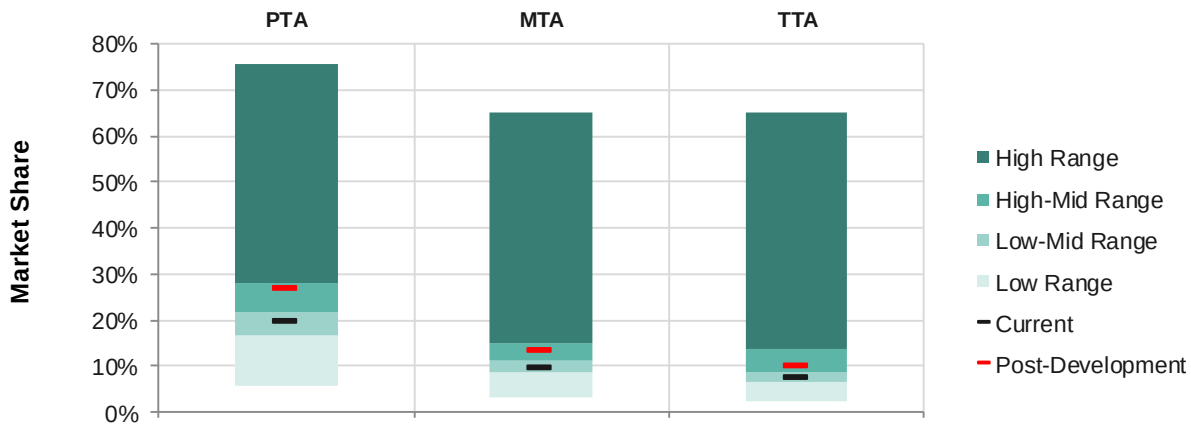
It is also relevant to consider the dollar impacts in relation to the turnover that would potentially be generated by these and other shopping centres over the intervening period. The impact analysis therefore details the turnover change, or net impact, which is expected for each centre/location, expressed as a reduction in turnover and as a percentage of the turnover level for each centre.

CENTRE FORECASTS

KEY INSIGHTS

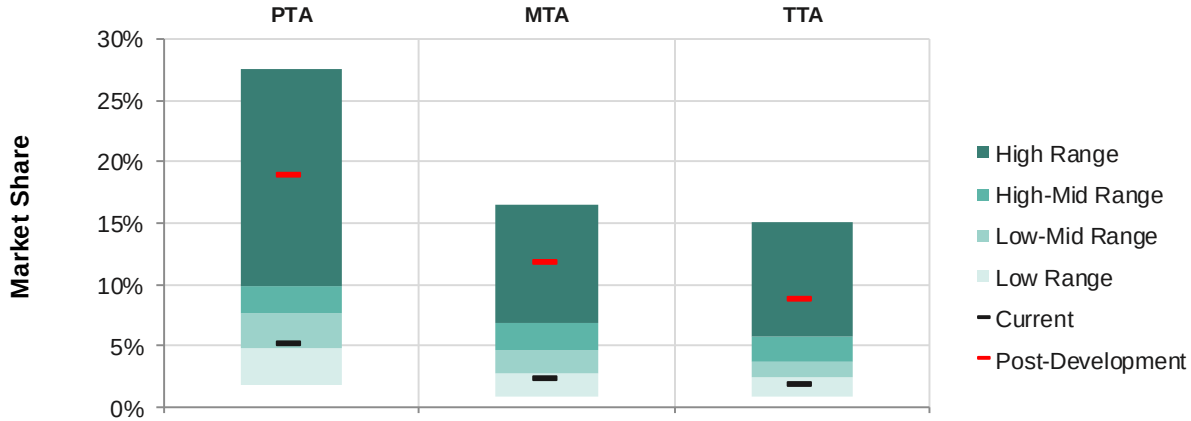
- Currently, the activity centre is estimated to have a low level of food retail and food catering market share compared to other sub-regional centres across Australia (being in the lowest quartile for both categories across all catchment boundaries).
- Following the redevelopment, market shares are expected to increase substantially for food catering while food retail is likely to remain in the lower bands post-development given the relatively small increases in this category.
- The relatively high food catering market share reflects the expected limited offering within other centres.

FOOD RETAIL BENCHMARK, SUB-REGIONAL CENTRES



Source: Urbis

FOOD CATERING BENCHMARK, SUB-REGIONAL CENTRES



Source: Urbis

CENTRE FORECASTS

KEY INSIGHTS

- Overall, retail market shares at the Kardinya Park Activity Centre are expected to increase substantially for food catering floorspace in the primary trade area, with total centre shares increasing from 5.2% to 17.7% in the primary catchment post development.
- Total retail market shares are expected to grow from 15.5% to 20.8% in the primary catchment following the development.
- The centre is additionally expected to benefit from trade outside the catchment related to workers, students and other visitors to the centre in addition to resident growth.

MARKET SHARES, KARDINYA PARK SHOPPING CENTRE

	Food Retail	Food Catering	Apparel	Home-wares	Bulky Goods	Leisure/ General	Retail Services	**Total Retail**
Primary								
Current TO	19.6%	5.2%	21.3%	12.7%	4.3%	8.1%	41.7%	**15.5%**
No Development (2030)	19.3%	5.0%	20.8%	12.4%	4.2%	7.9%	40.8%	**15.1%**
Development (2030)	25.2%	17.7%	20.0%	16.6%	2.7%	15.9%	55.1%	**20.8%**
Total Trade Area								
Current TO	7.6%	1.8%	9.8%	5.7%	1.9%	3.7%	16.1%	**6.3%**
No Development (2030)	7.4%	1.8%	9.4%	5.5%	1.9%	3.5%	15.7%	**6.0%**
Development (2030)	10.1%	8.7%	9.5%	7.7%	1.3%	7.4%	22.2%	**8.9%**

Source: Urbis

FORECAST SPENDING, KARDINYA PARK SHOPPING CENTRE

	Food Retail	Food Catering	Apparel	Home-wares	Bulky Goods	Leisure/ General	Retail Services	**Total Retail**
Primary								
Current TO	34	2	7	3	2	4	6	**57**
No Development (2023)	41	3	9	4	2	4	7	**70**
Development (2023)	53	10	9	5	1	9	9	**96**
Total Trade Area								
Current TO	55	3	14	6	3	7	9	**97**
No Development (2023)	66	4	17	8	4	8	11	**118**
Development (2023)	90	20	17	11	3	18	16	**174**

Source: Urbis

INDICATIVE CENTRE PERFORMANCE

KEY INSIGHTS

- The turnover of each relevant impacted centre has been estimated using a combination of available published data from the Property Council's survey of shopping centres and from annual reports.
- Where published data was not available, Urbis retail benchmarks were used to generate a turnover volume consistent with other centres with same components (e.g. single supermarket based centres, single DDS based centres).
- The turnover per square metre of GLA does not necessarily imply whether a centre is trading well given it is influenced by the tenancy mix. However, relevant centres are, on average, seen to be trading above Australian benchmark levels. Thus, the impact of the proposed expansion is considered to be less significant than it would for a lower performing centre.
- It should be noted that the Murdoch specialised activity centre features an indicative level of current turnover which is comprised of the small retail offering currently on the Murdoch university campus.

KEY IMPACTED CENTRES

	Current (2019)		
	Estimated Retail Turnover ($M)	Retail GLA (sq.m)	Turnover per Sq.m of GLA ($)
Kardinya Park	***108.1***	***15,223***	***$7,103***
Strategic Metropolitan Centre			
Fremantle Town Centre	459.1	65,023	$7,061
Specialised Activity Centre			
Murdoch Specialised Activity Centre*	12.1	1,500	$8,067
Secondary Centre			
Garden City	610.2	58,615	$10,410
Cockburn Gateway	361.7	44,825	$8,068
District Centre			
Stockland Bull Creek	105.5	16,209	$6,509
Livingston Marketplace	101.7	15,541	$6,544
Melville Plaza	87.0	8,627	$10,086
Phoenix Shopping Centre	110.1	20,826	$5,287
Stammers Shopping Centre	81.4	8,748	$9,305
Neighbourhood Centre			
North Lake Road	34.3	3,136	$10,938
Coolbellup Shopping Centre	60.3	6,700	$8,997

Source: Urbis

TURNOVER IMPACTS, 2030

KEY INSIGHTS

- Impacts on competing centres in 2030 are expected to be relatively modest, with the Fremantle Town Centre, and Garden City expected to experience the largest turnover impact (in dollar terms) due to the food and entertainment offerings in these centres.
- In smaller centres, the impacts are relatively subdued due to the proposed floorspace increases predominantly being in the retail specialties and food catering categories.
- The Kardinya Park expansion is unlikely to undermine the future development of the Murdoch Specialised Activity Centre, given fact that a large portion of expenditure the Murdoch development will capture will be from students, and workers in the future commercial development within the precinct.
- There are expected to be additional impacts than those identified in the table. This relates to spending impacts on, for instance, retailers in the Perth CBD and smaller centres.

IMPACT ON COMPETING CENTRES, 2030

	Est. Retail Turnover ($M)			Turnover ($M)		Impact (%)	
	Current 2019	Pre-Dev 2030	Post-Dev. 2030	Current 2019	Pre-Exp 2030	Current 2019	Pre-Exp 2030
	(1)	(2)	(3)	(4)=(3)-(1)	(5)=(3)-(2)	(6)=(4)/(1)	(7)=(5)/(2)
Kardinya Park	***108.1***	***126.2***	***195.4***	***+87.3***	***+69.2***	***+80.7%***	***+54.8%***
Strategic Metropolitan Centre							
Fremantle Town Centre	459.1	487.5	480.3	+21.2	-7.1	+4.6%	-1.5%
Specialised Activity Centre							
Murdoch Specialised Activity Centre*	12.1	170.6	167.7	+155.6	-2.9	+1286%	-1.7%
Secondary Centre							
Garden City	610.2	1008.8	994.2	+384.0	-14.6	+62.9%	-1.4%
Cockburn Gateway	361.7	457.5	452.4	+90.7	-5.1	+25.1%	-1.1%
District Centre							
Stockland Bull Creek	105.5	128.9	124.2	+18.7	-4.7	+17.8%	-3.6%
Livingston Marketplace	101.7	123.0	122.1	+20.5	-0.9	+20.1%	-0.7%
Melville Plaza	87.0	97.8	94.7	+7.7	-3.1	+8.9%	-3.2%
Phoenix Shopping Centre	110.1	145.0	140.5	+30.4	-4.6	+27.6%	-3.1%
Stammers Shopping Centre	81.4	93.6	90.7	+9.3	-2.9	+11.4%	-3.1%
Neighbourhood Centre							
North Lake Road	34.3	39.4	38.1	+3.7	-1.3	+10.9%	-3.4%
Coolbellup Shopping Centre	60.3	71.7	68.9	+8.6	-2.8	+14.3%	-4.0%

**The 'current' offering at the Murdoch specialised activity centre is the existing IGA express within the university campus, and the associated food & beverage offerings.*
Source: Urbis

EMPLOYMENT GENERATION

KEY INSIGHTS

- Employment opportunities within the main trade area are somewhat limited, with most residents travelling outside of the catchment to work in major employment centres in Fremantle or inner Perth.
- An expansion of floorspace in the local area however allows more people to be employed closer to home.
- During the construction phase, the development is likely to yield approximately 620 construction jobs (in terms of full-time equivalent job years) given the substantial level of investment ($118m). This includes approximately 150 direct jobs.
- In terms of ongoing jobs, the retail expansion is likely to yield an additional 395 jobs. The non-retail uses are expected to support approximately 350 additional jobs in the centre.
- It should be noted that this development impact does not include the residential development that is likely due to occur following the increase in residential zoning on 51ha of residential land surrounding the activity centre, which will involve the development of 1,856 new dwellings (1,216 net dwellings).

CONSTRUCTION PHASE EMPLOYMENT

Impact Summary	Direct Effect	Supply-Chain Effect	Consumption Effect	Total Effect
Output ($M)	$118.2	$134.5	$56.3	$309.1
Employment (Jobs)	150	307	163	620
Wages and Salaries ($M)	$11.7	$28.0	$12.7	$52.5
Value-added ($M)	$24.9	$51.1	$29.8	$105.8

Source: Urbis, Remplan

ESTIMATED ADDITIONAL ONGOING EMPLOYMENT

Expansion Category	Land Use	SQ.M Per Employee	Expansion Floorspace	Estimated Jobs
Retail Expansion	Shop Retail	29	11,468	395
Commercial Office/Medical/Other Non-retail	Commercial	27	8,237	305
Cinema	Entertainment	93	4,100	44
Motor Vehicle Repair / Car Wash	Service	115	355	3
Total Jobs		**32**	**24,160**	**745**

Source: Urbis, DPLH Perth Land Use and Employment Service

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Appendix 2: Cardno - Traffic Impact Assessment

Kardinya Activity Centre Structure Plan

Transport Impact Assessment Report

CW1087800

Prepared for
Dato Holdings Pty. Ltd.

15 May 2020

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D	18/03/2020	For Issue	Brian Sii	Scott Lambie
E	19/03/2020	For Issue – Parking Update	Brian Sii	Scott Lambie
F	15/05/2020	For Issue – Yield Update	Brian Sii	Scott Lambie

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Appendices

Tables

Figures

1 Introduction

1.1 Background

Dato Holdings Pty Ltd has commissioned Cardno to prepare a Transport Report in support of the Structure Plan for the Kardinya Activity Centre. This report has been prepared to complete the 'Movement' component of the Structure Plan, in accordance with *State Planning Policy 4.2 Activity Centres for Perth And Peel*.

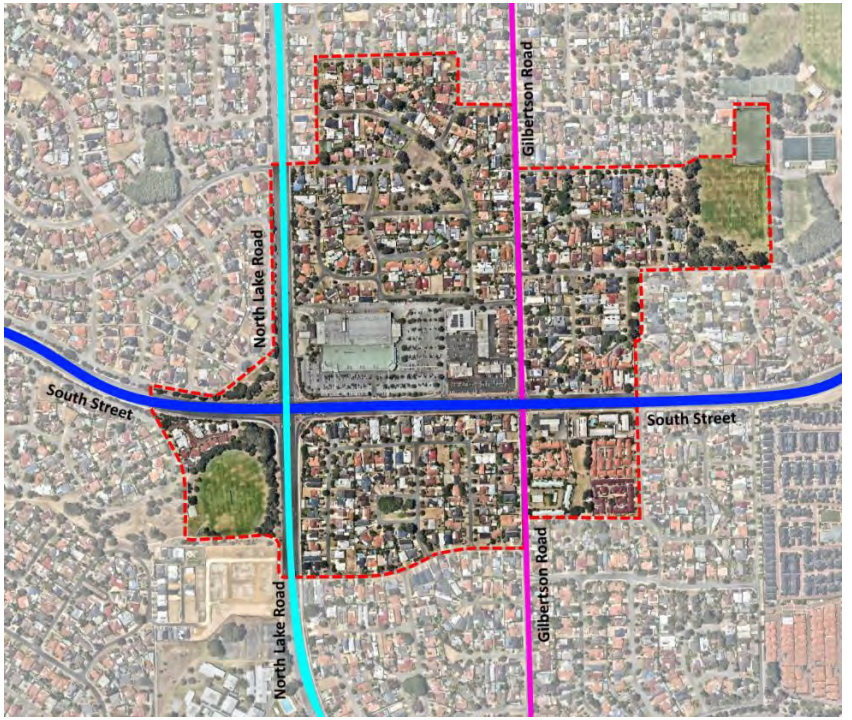
This report includes consideration of transport requirements, opportunities, constraints and assessment of potential future development scenarios both in the medium and long-term.

1.2 Activity Centre Context Plan

Kardinya Activity Centre is located within the City of Melville, 1.5km to the west of Murdoch University, 2km east of O'Connor Industrial Area, approximately 14km south of Perth CBD, 6.5km east of Fremantle.

The proposed structure plan includes development of the Kardinya Shopping Centre, as well as the area in the vicinity which currently comprises commercial development and residential neighbourhoods.

Figure 1-1 Kardinya Activity Centre Site Location



1.3 Points of Arrival

The points of arrival experienced by visitors to the Activity Centre is influenced by their chosen transport mode. As such, the key entrance locations should be designed to accommodate the desired transport modes.

1.3.1 Private Vehicles

The main approach routes to the Kardinya Activity Centre includes South Street from the west and east, and North Lake Road from the north and south. South Street bisects the activity Centre and is a preferred route for local traffic accessing the Activity Centre as it is connected to Kwinana Freeway further east.

Gilbertson Road acts as a local distributor, connecting residential areas with the major road links.

1.3.2 Public Transport

The Activity Centre benefits from excellent opportunities for public transport services, with bus stops located along South Street, connecting major attractors outside of the Activity Centre. These bus stops, and the pathways in their immediate vicinity define the point of arrival for public transport trips.

1.3.3 Pedestrians and Cycling

The existing environment along the Primary Road network is not conducive to pedestrian and cycling trips for the majority of purposes. These roads are hostile for on-road cycling and have limited provision within the verge area to attract active transport users.

As such, active transport to the Activity Centre is expected dominated by short-distance trips from the adjacent residential catchments. Key points of arrival are therefore related to crossing points at intersections and mid-block.

1.4 Key Sites

Key sites within the Activity Centre core include the Kardinya Shopping Centre and adjacent commercial developments adjacent. These sites are located on the north side of South Street.

2 Existing Situation

2.1 Road Network

The MRWA Metropolitan Functional Road Hierarchy (MFRH) classifies the roads within Kardinya Activity Centre as shown in **Table 2-1**.

Table 2-1 Road Hierarchy

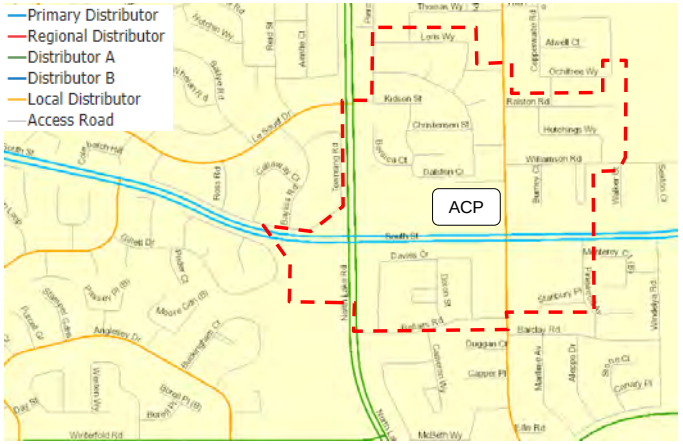
Street Name	MRFH Category
South Street	Primary Distributor
North Lake Road	Distributor A
Le Souef Drive	Local Distributor
Gilbertson Road	Local Distributor
Petterson Avenue	Local Distributor
Other Roads	Access Road

These classifications are defined in the MFRH as follows:

- **Primary Distributors:** These provide for major regional and inter-regional traffic movement and carry large volumes of generally fast-moving traffic. Some are strategic freight routes and all are National or State roads. They are managed by Main Roads.
- **District Distributor A:** These carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by Local Government.
- **Local Distributors:** Carry traffic within a cell and link District Distributors at the boundary to access roads. The route of the Local Distributor discourages through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. They are managed by Local government.
- **Access Roads:** Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by Local government.

Figure 2-1 shows the MRFH map for the Kardinya Activity Centre

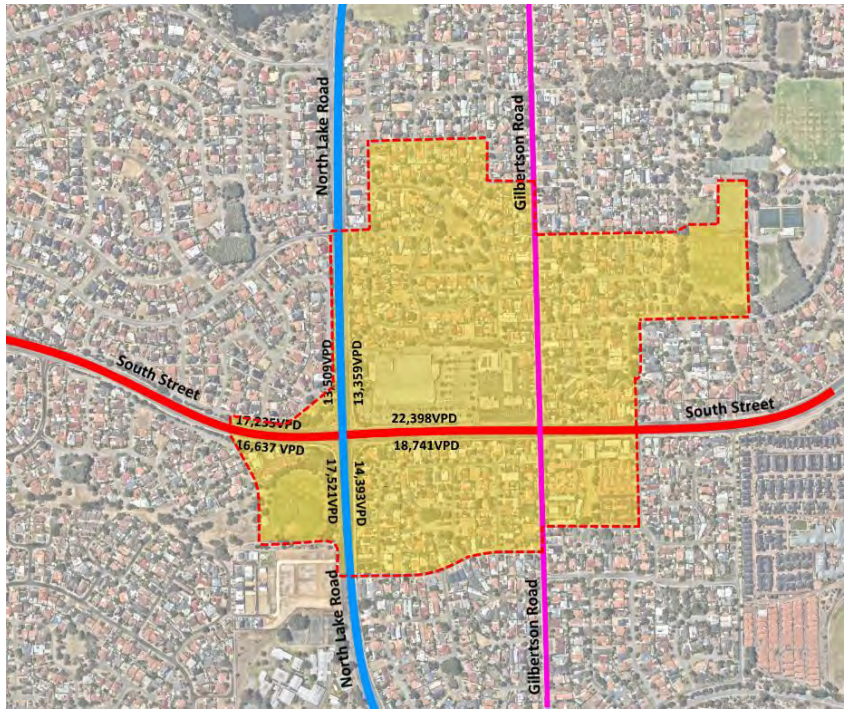
Figure 2-1 Main Roads Functional Road Hierarchy



2.2 Traffic Volumes

The existing traffic volumes has been obtained from Main Roads Traffic Map and SCATS data, as shown in **Figure 2-2**.

Figure 2-2 Existing Traffic Volumes



Source: Nearmap

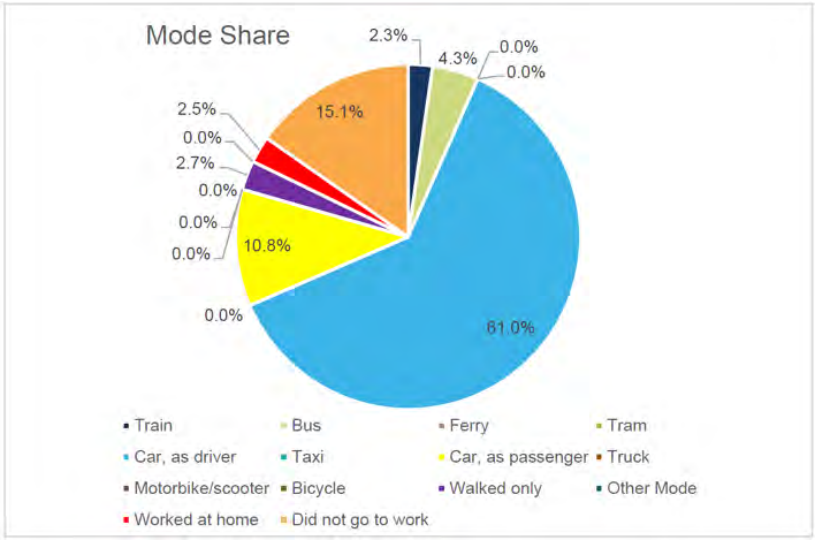
2.3 Transport Mode Share

2.3.1 Employees

The existing transport mode share pattern according to the Australian Bureau of Statistics for retail workers in the City of Melville is shown in **Figure 2-3**. These employees make up the majority of the current and future demand for journey to work in the Kardinya ACSP.

Based on this census data, approximately 84% of retail employees that attended work required on-site parking, and only 8% travelled by public transport.

Figure 2-3 Retail Employee Mode Split (City of Melville)



2.3.2 Residential Journey to Work

The transport mode share for existing residents in Kardinya has been extracted from ABS Census data (2016) and described in **Section 7.3.** While journey-to-work does not represent the entirety of travel, it is the dominant trip purpose both during the peak period and across the day (refer to **Table 2-2** below).

Table 2-2 Mode of Transportation to work (Kardinya)

	Work	Education	Other
Car as Driver Trips by Purpose	56%	29%	15%

As such, employee travel presents the greatest opportunity for mode shift, as it typically occurs regularly and at a consistent time of day. Conversely, the travel behaviour of shoppers is generally more constrained by external factors, such as route choice, trip chaining requirements and infrequent and unfamiliar destination.

2.3.3 Future Mode Share

A target private vehicle mode share has been established for these “journey to work” trips: decreasing from 84% (current) to 70% (future) in line with similar Activity Centre locations. This change is related to expected improvements in public transport infrastructure, and the effects of densification and parking constraint on residential household behaviour.

To accommodate the shift from driving within a private vehicle to public and active transport modes, as well as the overall growth in travel demand for the ACSP, improvements in sustainable transport provision are recommend in **Section 3** and **Section 4**.

3 Proposed Developments

A projected development scenario has been described by the Kardinya ACSP, consisting of intensification of existing retail development and residential land uses, as follows:

- The expansion of Kardinya Shopping Centre to provide approximately an additional:
  - 6,692m² non-residential floorspace
  - 8,913m² shop/retail floorspace
- Residential densification resulting in an expected net increase of approximately 467 dwellings by 2031, providing homes for approximately 840 additional people in a medium to high rise environment, based on a consistent gradual uptake of development. Ultimately the 2050 forecast for additional dwelling numbers is expected to be approximately 1,875 residences (net increase of 1,246) and a population of 3,375 people, based on a 50% development uptake.

This Transport Report has been undertaken to determine the needs of the potential mix of land uses, and the associated broad-scale traffic impacts of intensification in this area. The distribution of these land uses is described in the ACSP, and shown below, **Figure 3-1**.

Figure 3-1 Proposed ACSP Land Uses

Source: Kardinya Activity Centre Structure Plan

4 Public Transport

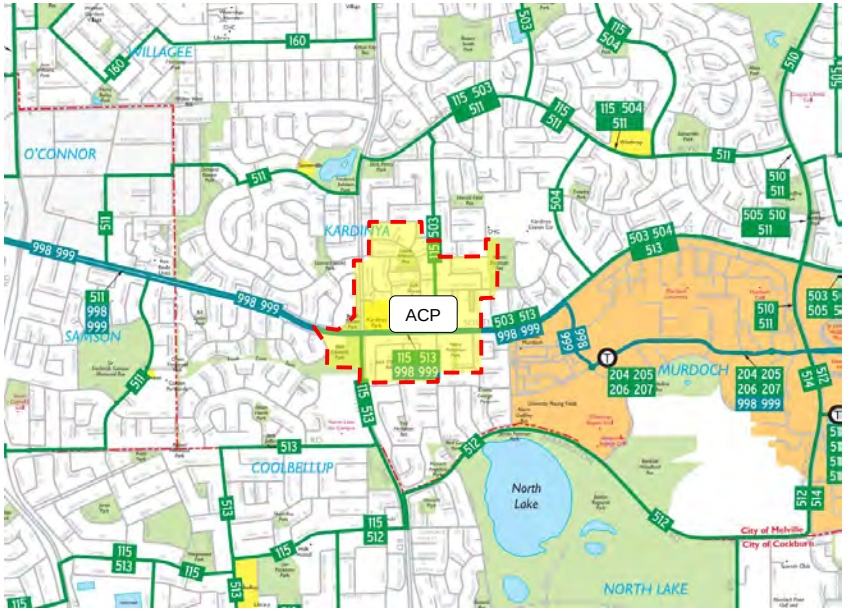
4.1 Existing Public Transport Facilities

The existing public transport facilities in the vicinity of the Activity Centre are shown in **Figure 4-1**. The Activity Centre is serviced by Bus Route 115, 503, 513, 998 and 999, which provides connection to Fremantle, Murdoch Station, Bull Creek Station and South Perth.

The nearest train station (Murdoch Station), is located approximately 2.5km east of the Activity Centre, and provides a north-south regional connection along the Mandurah train line.

Existing bus service frequency is described in **Table 4-1**. Overall, the Site benefits from excellent public transport services which are high frequency and easily accessible.

Figure 4-1 Public Transport Network



Source: Public Transport Authority – Network Map

Table 4-1 Bus Services Frequency

Route	Frequency		
	Weekday Peak	Weekday Off Peak	Weekend
999	5 – 10 mins	15 mins	15-30 mins
998	5 – 10 mins	15 mins	15-30 mins
115	15 mins	20 – 30 mins	30 mins
503	10 – 15 mins	20 – 40 mins	N/A
513	15 mins	20 – 30 mins	60 mins

4.2 Regional & Structure Plan Public Transport Strategies

4.2.1 Short to Medium Term – Changing Travel Behaviour

The strategy for the short to medium term is to increase the use of the existing services, while allowing for new bus route along North Lake Road connecting Kardinya to catchments to the north and south.

To encourage public transport modes, a number of measures are proposed as part of the ACSP, including the provision of premium bus stops and improving service frequency. To fully support public transport modes as a viable and attractive alternative to private vehicles, **bus frequencies would need to be increased** to 10 mins during peak hour for bus Routes 513 and 115.

4.2.2 Short to Medium Term – Bus Stops improvement

The **construction of premium bus stops** with a larger seating and sheltered area than the existing standard bus stop on South Street would improve the quality of public transport amenity and enhance these points of arrival for PT users.

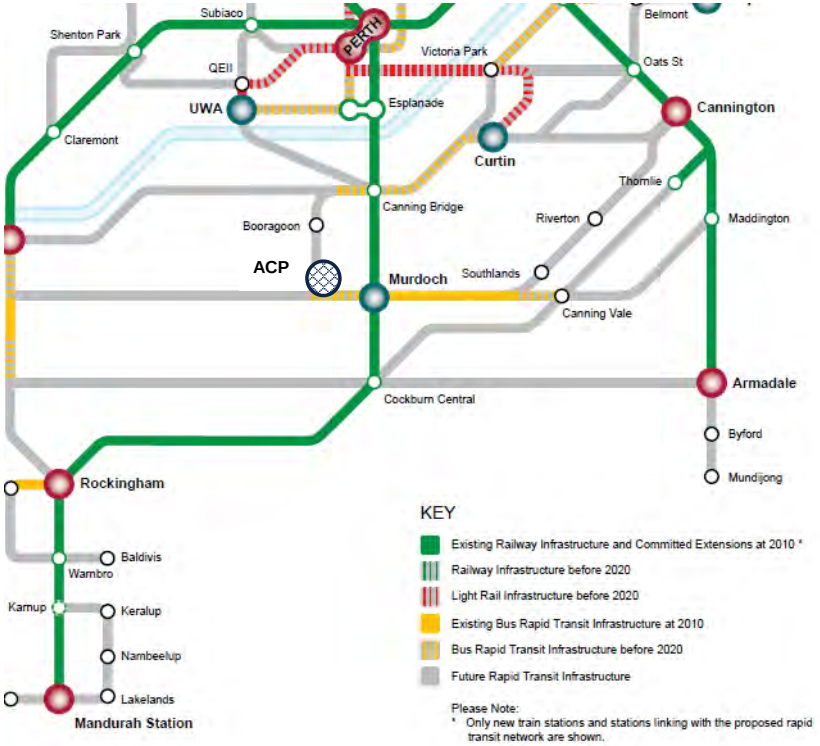
Relocation of the existing bus stop (number 10489) to the west has been proposed (currently located approximately 200m east of North Lake Road along South Street) to provide improved access to the Kardinya Shopping Centre. Improvements at the new location, including at grade access for pedestrians into the shopping centre complex and infrastructure upgrades will increase pedestrian amenity and safety when accessing the bus stop. The proposal to relocate the stop closer to the North Lake Road intersection will promote increased use of the South Street / North Lake Road signalised intersection for improved pedestrian safety when crossing the 6 lane South Street carriageway.

4.2.3 Long Term – Bus Rapid Transit

The long-term plan for the ACSP reflects the Department of Transport's *Public Transport for Perth in 2031*, anticipating a **high-capacity public transport** (**BRT/LRT) route connecting Kardinya Centre with Murdoch Station**. It is expected that high frequency collector bus services would then connect users to this future express service, creating an efficient and attractive service for a wide range of trip purposes.

The future plan sourced from the *Department of Transport* is shown in **Figure 2-2**. The aim of rapid transit is to deliver something akin to a suburban light rail service. BRT would run on a limited stop, express service basis, providing a convenient, reliable service with as little interruption to journeys as possible. It is assumed BRT vehicles will have higher priority over traffic along the BRT route. This would entail provision of bus lanes and signal phasing that would allow bus priority through selected signalised intersections.

Figure 4-2 Future Public Transport Network Plan



Source: Department of Transport – Public Transport for Perth in 2031

The above changes are identified in **Figure 4-3** for public transport within the ACSP and surrounds

Figure 4-3 Public Transport Infrastructure – Existing and Proposed

Source: Perth / Peel 3.5 million – Sub regional Planning Framework

5 Active Transport

5.1 Existing Active Transport Provision

The cycle network in the vicinity of the Activity Centre is shown in **Figure 5-1** as defined by the Department of Transport's *Perth, Fremantle and Stirling: Perth Bike Map.*

Shared paths exist along South Street and North Lake Road, provided rudimentary cycling access to and from the Site. The network of cycling facilities is discontinuous and compromised by the high-speed, high volume road environments of North Lake Road and South Street.

Beyond the immediate vicinity of the ACSP, on-road sealed shoulders and quiet streets support connection to regional cycling facilities to the Murdoch Activity Centre and Kwinana Freeway.

Figure 5-1 Cycle Network in the vicinity of the Site

Source: Department of Transport – Swan and Stirling Bike Maps

5.2 Structure Plan Active Transport Strategies

5.2.1 Pedestrian Access – Improved Pedestrian Servicing Across South Street

According to City of Melville's *Local Planning Strategy 2016*, the Kardinya ACSP is a key destination for north-south pedestrian movements across South Street. A significant volume of pedestrians currently cross South Street at-grade to access the Shopping Centre or adjacent bus stops. The lack of supportive crossing represents a safety risk, and may have contributed to a fatal pedestrian crash in 2017.

To improve the pedestrian amenity and safety, **the bus stop** located approximately 200 metres east of North Lake Road is proposed to be moved approximately 100 metres closer to the traffic signals. Due to the rising grade along South Street, this new location will provide for the opportunity for direct pedestrian at grade access into the shopping centre via the covered multi-level car park structure. The relocated stop will also provide further incentive for pedestrians to utilise the signalised crossing opportunities at the intersection of South Street and North Lake Road, which already provides a safe and attractive pedestrian crossing facility, supporting non-car access to key destinations in the ACSP.

5.2.2 Cycling – TravelSmart Innovation ('Your Move')

Figure 5-2 Existing Bike Racks

The *City of Melville Bike Plan* (2012) sets out a strategic vision for the continued development and promotion of cycling including the initiation of TravelSmart innovations towards cycling. Some of the proposed strategic objectives include improved signage and line markings, cycling path replacements, resealing of shared paths and bicycle lanes at locations identified within the Plan.

Figure 5-3 Prioritised Proposed Projects

Source: Extract from City of Melville Bike Plan (2012)

The *City of Melville Bike Plan 2012* contains the following recommended infrastructure upgrades:

- **Upgrade of the South Street shared path** to a wider cross section that allows 2m segregated cycle lanes and up to 3.5m shared paths. Also construct the missing link in the shared path on the southern side of South Street between Prescott Drive and Discovery Way; and
- **Construct a commuter-friendly PBN route along North Lake Road** consisting mainly signs and markings, and upgrade of substandard sections of the shared path up to 3.5m width.

Work is currently taking place in collaboration between the Department of Transport and the City of Melville to determine a combined Long-Term Cycle Network (LTCN). This will form the basis for long-term decision-making on cycling infrastructure within the City and across the Perth Metropolitan Area.

6 Parking Calculation

6.1 Methodology

A parking demand assessment methodology has been completed for the non-residential land uses within the ACSP. This analysis includes an understanding of the influence of mixed-use development on internal trip containment and shared parking, creating a reasonable benchmark for *free and unconstrained* parking demand. This assessment has been used to inform the provision of parking, vehicle trip generation (and the impacts of traffic growth on the road network), and the requirements for sustainable transport

6.2 Nomenclature

6.2.1 Parking Supply

Parking supply is the total quantum of parking spaces that are built or available within the study area, regardless of whether or not they are utilised. Parking supply only includes marked spaces and does not include areas designated for standing vehicles.

6.2.2 Parking Demand

Parking demand is the accumulation of vehicles parked within the study area at a point in time. Parking demand includes all parking associated with the associated land uses, whether in an off-street facility, parked illegally, parked on-street or in remote parking lots. Parking demand does not include standing vehicles awaiting the pick-up or drop-off of passengers.

6.2.3 Shared Parking

Shared parking is parking that is used by 2 or more land uses instead of restricting parking to the exclusive use of a single land use - the more exclusive the parking is, the less effective it becomes for the development as a whole.

6.2.4 Reciprocal Parking

Reciprocal parking occurs when a visitor has more than one purpose within an area and hence only one trip is required to serve two or more purposes. The degree of reciprocal parking occurring depends on the type of land use in the vicinity and the time of day.

The most important component to determine the rates of reciprocal parking is the proximity of the sympathetic land uses. As all development within the Kardinya ACSP is generally located within acceptable walking distances, and all parking within the precinct can be assumed to be publicly accessible, trips made within the precinct are expected to be largely undertaken by foot or by bicycle. This trips therefore do not require a parking space, and do not generate traffic impacts.

6.3 Anticipated Future Parking Demand

The calculated non-residential parking demand was determined using the methodology described above, with land use and dwelling yields as defined in the Kardinya ACSP.

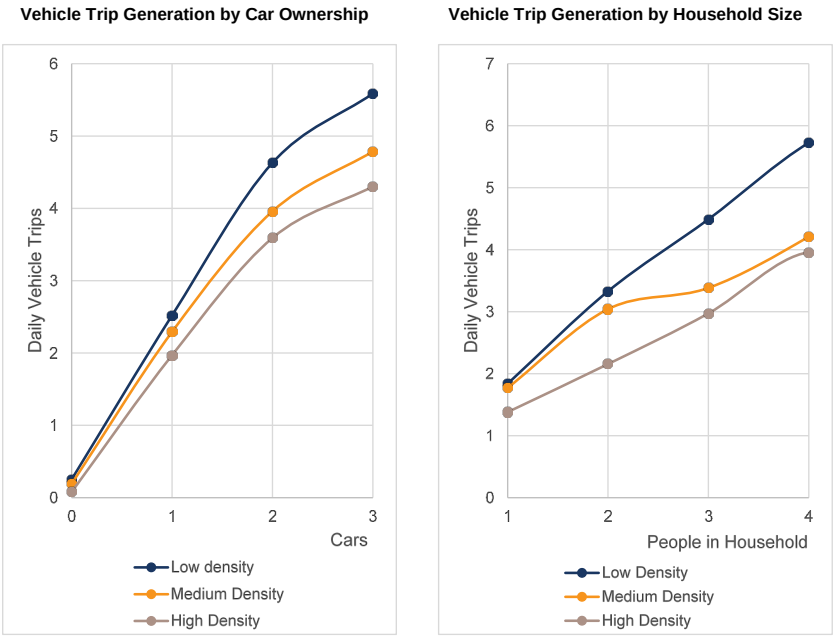
6.3.1 Residential

Residential parking within the Activity Centre is to be provided as per State Planning Policy 7.3. Whilst the Activity Centre's location in the regional context means that a high volume of regional traffic may be generated by residential development, resulting in a significant effect on local intersections, SPP7.3 allows for reduced parking in areas where there is a high level of access to high frequency of public transport such as Kardinya Activity Centre. This includes the need to only provide an average of 0.75 bays per 1-bedroom apartment and only 1 bay per apartment for dwellings with 2 or more bedrooms.

To further minimise the impact of traffic it is proposed to allow grouped dwellings within the activity centre to also only have one dedicated car parking bay.

This would assist in supporting a sustainable transport environment by reducing private vehicle ownership by residents, resulting in a decrease in private vehicle mode share, vehicle trip generation and congestion. This effect is clearly illustrated by the results of the Victorian Integrated Survey of Travel and Activity (VISTA), as shown in **Figure 6-1** below.

Figure 6-1 Average Household Vehicle Trip Generation Rates (VISTA)



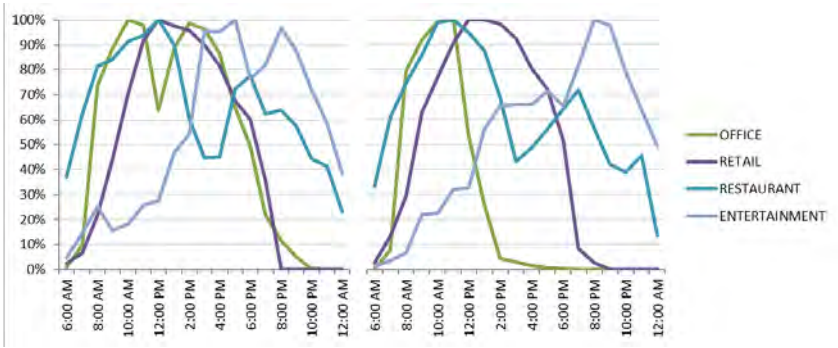
6.3.2 Commercial

It is expected that the parking demand rate for commercial will reduce as the commercial component within the ACSP expands. This is mainly due to greater opportunity for reciprocal and shared parking within the Centre, and is consistent with experience in major centres across Australia.

This effect is compounded by the influence of improved sustainable transport infrastructure, providing safe and attractive alternatives to driving for all trip purposes.

An assessment of the parking requirement for the land uses within the Activity Centre has been undertaken, including time-of-day profiles for parking generation, as shown in **Figure 6-2**.

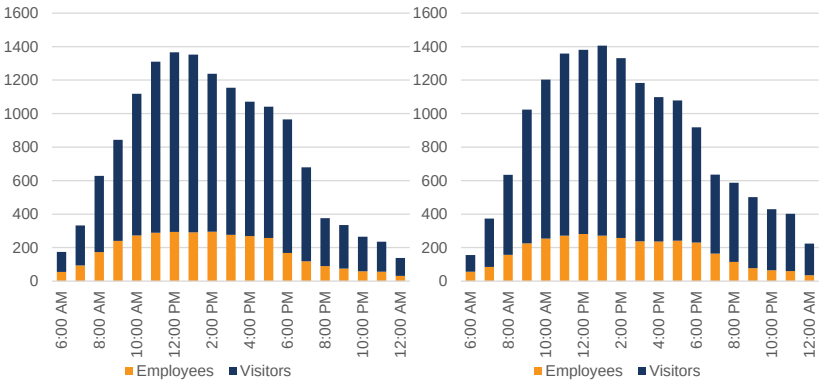
Figure 6-2 Time-of-day profile for Land Use Categories



Based on the information, an uncalibrated peak parking demand of approximately 1,200 parking bays has been identified, suggesting that an ultimate non-residential parking supply of 1,350 on-street and off-street spaces would be required (considering the efficiency of parking across the Precinct). This represents an average supply rate of approximately 5.2 spaces per 100sq.m, including all public and private supply.

The expected use of these bays is shown in **Figure 6-3**, for a typical weekday and weekend period.

Figure 6-3 Time-of-day utilisation by trip Purpose



Internal parking management would need to be designed to support this requirement, mainly through duration restrictions; but over time, paid parking and pricing mechanisms may be required to ensure operational efficiencies and encourage behaviour change.

This could also include a form of demand responsive pricing (DRP). That is, parking pricing levels set such that demand peaks at approximately 85-90% occupancy. This could involve different fees at different times of day, or different days of the week, and include a mechanism to modify prices on a periodical basis to maximise the utility of the parking.

By restraining parking supply through capacity restraint and timed parking, and in the longer term, paid parking, further activity growth in the precinct will be accompanied by expansion in non-car transport modes. This forms a sustainable development pattern that is consistent with the goals of the WAPC SPP 4.2: Activity Centres for Perth and Peel as well as the City of Melville's Sustainability Policy.

The balance between ensuring an accessible and viable shopping and behaviour change needs to be carefully managed and assessed regularly during the operational phase of the development.

7 Traffic Analysis

A desktop model of the Kardinya Activity Centre was developed in order to determine the impact of the planned development on intersection performances and road capacities. SCATS data for the signalised intersections sourced from MRWA and supplementary traffic count data was used to determine the turning movements proportions at critical intersections in and around the Activity Centre.

7.1 Trip Generation

The 2031 trip generation for the Activity Centre is based on the land use and dwelling yields as defined by The Activity Centre Structure Plan.

A summary of the ultimate dwelling yields is shown in **Figure 7-1**.

Figure 7-1 Projected Dwelling Yield by Block

The daily traffic generation and traffic generation for AM and PM peak periods are shown in **Table 7-1**.

Table 7-1 Kardinya Activity Centre Traffic Generation (2031)

Land Use	AM Peak	PM Peak	Daily
Residential (467 Additional Dwellings)	319	319	2,338
Kardinya Park Shopping Centre	672	1,498	14,800
Aldi & Commercial Developments	193	426	3,885
Total	**1,184**	**2,243**	**21,023**

**Reduced trip based on Reciprocal and Share parking demand*

7.2 Reciprocal and Shared Demand for Non-residential Developments

The Activity Centre benefits from the proximity of residential, commercial and retail uses, which promotes an internal walkable catchment that reduces the requirement for private vehicle transport. Additionally, a variety of retail and recreational uses in close proximity supports trip chaining, eliminating the need to make multiple car trips to fulfil daily tasks.

In order to capture the consistency between the parking demand calculations and trip generation calculation, a reduction was applied to account for these internal walking trips within the Kardinya Activity Centre.

Calculations from Cardno's Parking Model indicate the scale of internal trip capture for the future Centre, as shown in **Table 7-2**. This indicates the proportion of trips to and from the generators and attractors within the Activity Centre, which do not contribute any traffic to the road network.

Note that within this assessment, a reduction factor has only been applied to the component of traffic generated by non-residential developments within the Kardinya Activity Centre.

Table 7-2 Traffic Generation Reciprocal Factors

Land Use	AM Peak	PM Peak	Daily
Proportion of Internal trip capture	19%	35%	28%

7.3 Transport Mode and Reciprocal Demand Factors

As discussed in Section 2.3, it is expected that the private vehicles demand for both residents and employees within the Activity Centre will be significantly reduced.

As discussed in Section 2.3.1, the current mode share for journey to work to the Site is represented by 61% private vehicles.

The existing journey to work for residents within the Activity Centre is presented as 56%. In the future, with the public transport improvements and arising popularity of ride sharing services, a 43% of private vehicle mode share for journey to work is targeted, resulting in a reduction of 77% private vehicle for work trips.

The reduced traffic generation for each land uses within the Activity Centre is presented in **Table 7-3**.

Table 7-3 Kardinya Activity Centre Traffic Generation (2031)

Land Use	AM Peak	PM Peak	Daily
Residential Traffic Generation			
Residential (467 Additional Dwellings)	319	319	2,338
Impact of Journey to Work Mode Shift		*13%*	
Modelled Residential Traffic Generation	**278**	**278**	**2,034**
Non-Residential Traffic Generation			
Kardinya Park Shopping Centre	672	1498	14,800
Other Commercial Development	193	426	3,885
Impact of Journey to Work Mode Shift	*6.4%*	*3.2%*	*4.5%*
Internal Trip Proportion	*19%*	*35%*	*28%*
Modelled Commercial Traffic Generation	**655**	**1210**	**12,848**

7.4 Trip Distribution and Assignment

The nature of the traffic entering and exiting the network was disaggregated to assess whether the traffic was purely regional, purely local or a mix of the two, in which case a proportion of local traffic was determined. Trips were then distributed to the boundary road network.

The outcomes from these assumptions are shown in **Figure 7-2** and attached in **Appendix A**.

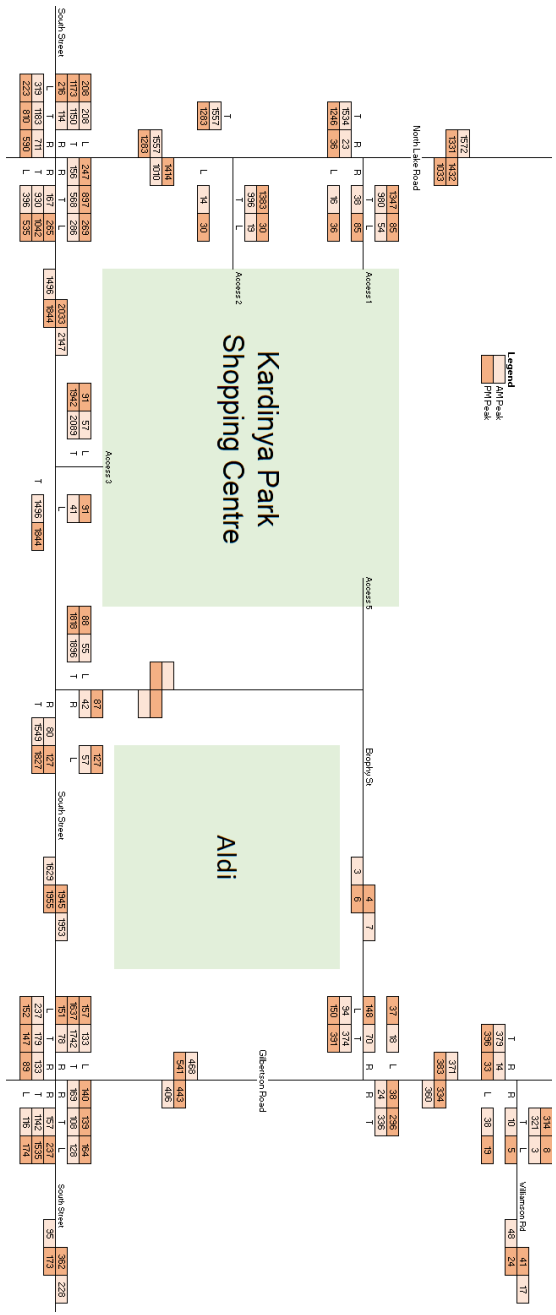


Figure 7-2 Simplified Network Model (2031)

7.5 Impact of Regional Traffic

The existing road use shows a high volume of regional trips currently using South Street and North Lake Road. This traffic is expected to increase in the short-term future as additional regional connections are made. It is expected however that over time, as population density increases and improved alternative transport modes and links are established, a shift away from the use of private car trips will result in a slowed or even a possible retraction in traffic growth over the longer term. Given that both aforementioned major roads bisect the Kardinya Activity Centre, this highlights the importance of proper long-term regional transport planning to support developments of this type.

7.6 Traffic operations Assessment

SIDRA outputs for each approach to evaluate the impact of the increased volumes anticipated for the ultimate development scenario (including background), are presented in the form of Degree of Saturation (DOS), Average Delay, Level of Service (LOS) and 95th Percentile Queue. A definition of these characteristics are as follows:

- **Degree of Saturation (DOS):** is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow, up to one for saturated flow or capacity. The theoretical intersection capacity is exceeded for an un-signalised intersection where DOS > 0.80;
- **95% Queue:** is the statistical estimate of the queue length up to or below which 95% of all observed queues would be expected;
- **Average Delay:** is the average of all travel time delays for vehicles through the intersection. An un-signalised intersection can be considered to be operated at capacity where the average delay exceeds 40 seconds for any movement;
- **Level of Service (LOS):** is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. **Table 6-4** provides a description of the different levels of service.

Table 7-4 Level of Service (LOS) Performance Criteria

LOS	Description	Signalised Intersection	Unsignalised Intersection
A	Free-flow operations (best condition)	≤10 sec	≤10 sec
B	Reasonable free-flow operations	10-20 sec	10-15 sec
C	At or near free-flow operations	20-35 sec	15-25 sec
D	Decreasing free-flow levels	35-55 sec	5-35 sec
E	Operations at capacity	55-80 sec	35-50 sec
F	A breakdown in vehicular flow (worst condition)	≥80 sec	≥50 sec

For the purpose of this assessment, vehicle Level of Service is deemed acceptable if the intersection operated at a Level of Service E or better and the delays/queues generated by individual turning movements are not deemed to negatively impact adjacent intersections. These criteria are consistent with the intended operation of Kardinya Activity Centre with a focus on pedestrian connectivity and sustainable transport modes.

7.7 Impact of Future Volumes using Existing intersection Geometry

SIDRA intersection operation analysis was undertaken for a series of critical intersections with peak hour traffic volumes determined through the desktop modelling process described above. Intersection were assessed for the ultimate demand scenario including redistribution of regional traffic. Restrictions on parking quantum were translated into peak demand reductions on a 1:1 proportional basis. For the purpose of this locations assessed included the following signalised intersection:

- South Street / North Lake Road
- South Street / Main Street (Kardinya Shopping Centre)
- South Street / Gilbertson Road
- Gilbertson Road / Brophy Street
- Gilbertson Road / Williamson Road

SIDRA analysis will be conducted for the following scenarios:

- Scenario 1 – Background Traffic (Extracted from the Kardinya Shopping Centre Traffic Report)
- Scenario 2 – 2031 Background + 30% Residential Development + Kardinya Shopping Centre Redevelopment
- Scenario 3 – Ultimate Scenario Full Build Out

The following sections present the anticipated intersection operations for existing geometry.

7.7.1 North Lake Road / Access 1

The North Lake Road / Access 1 Intersection is located to the northwest of the Kardinya Park Shopping Centre, representing a major access point for the shopping centre within the expansion plan. The SIDRA Analysis results shown in **Table 7-6** and **Table 7-7,** indicates a LoS F for the right turn out movement on the existing intersection layout during the PM peak for both 2031 and Ultimate scenario. However, this delay results in only minor queuing and no impact on the broader network.

This assessment considers the operation of this intersection in isolation. However, due to the influence of the upstream signals at South Street/North Lake Road, it can be expected to perform better than shown. This is as a result of traffic platooning effects which will increase the frequency and duration of gaps in traffic flow.

Table 7-5 SIDRA Analysis - North Lake Road / Access 1 – (2020 Background)

Intersection Approach		PM Peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: North Lake Road	T	0.234	0	A	0	0.189	0	A	0
	R	0.045	13.2	B	0.3	0.097	19.2	C	0.7
East: Access 1	L	0.005	5.4	A	0	0.097	5.9	A	0.8
	R	0.031	12	B	0.2	0.097	19.3	C	0.8
North: North Lake Road	L	0.13	6.5	A	0	0.184	6.5	A	0
	T	0.13	0	A	0	0.184	0	A	0
All vehicles		0.234	0.3	A	0.3	0.189	0.5	A	0.8

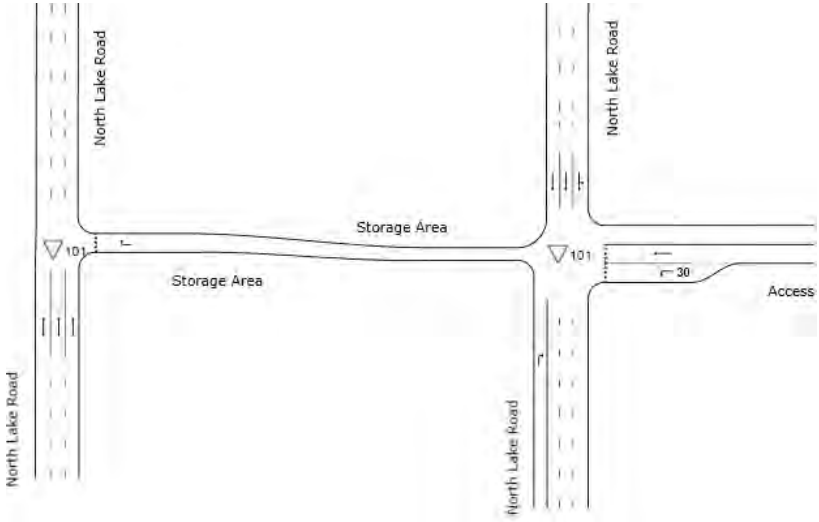
Table 7-6 SIDRA Analysis - North Lake Road / Access 1 – Existing Geometry (2031 Background + Development)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: North Lake Road	R	0.094	20.4	C	0.9	0.341	42.4	E	3.3
	T	0.268	0	A	0	0.218	0	A	0
East: Access 1	L	0.016	1.2	A	0.2	0.045	1.9	A	0.5
	R	0.172	20.8	C	1.8	0.89	110.7	F	15.5
North: North Lake Road	L	0.183	6.5	A	0	0.254	6.4	A	0
	T	0.183	0	A	0	0.254	0	A	0
All vehicles		0.153	1.3		1.8	0.89	7.6		15.5

Table 7-7 SIDRA Analysis – North Lake Road / Access 1 – Existing Geometry (Ultimate Scenario)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: North Lake Road	R	0.096	20.6	C	0.9	0.353	44.1	E	3.4
	T	0.272	0	A	0	0.22	0	A	0
East: Access 1	L	0.016	1.2	A	0.2	0.046	1.9	A	0.5
	R	0.166	21.1	C	1.7	0.941	133.8	F	18.7
North: North Lake Road	L	0.184	6.5	A	0	0.258	6.4	A	0
	T	0.184	0	A	0	0.258	0	A	0
All vehicles		0.153	1.3		1.7	0.941	8.9		18.7

Figure 7-3 North Lake Road / Access 1 – Existing Intersection Layout



7.7.2 South Street / North Lake Road

The South Street / North Lake Road represents a major entry point to the Activity Centre. Both South Street and North Lake Road carry a large volume of regional traffic. The existing South Street / North Lake Road intersection has three through lanes in each direction as well as additional dedicated turning pockets (see **Figure 7-4**).

The SIDRA Analysis results shown in **Table 7-9** and **Table 7-10** indicate that performance may deteriorate to LOS F for some movements during the peak period for both 2031 and ultimate scenario.

However, it is noted that the average intersection delays are approximately 60 seconds for both AM and PM peak, and with Degree of Saturation less than 0.95. Hence, the intersection is considered to be capable of taking on future traffic.

Table 7-8 SIDRA Analysis – South Street / North Lake Road – (2020 Background)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: North Lake Road	L	0.157	6.7	A	0	0.11	6.7	A	0
	T	0.908	68.4	E	123	0.781	51.9	D	58.9
	R	0.855	65.3	E	87.8	0.855	64.4	E	61.7
East: South Street	L	0.185	6.7	A	0	0.258	6.7	A	0
	T	0.501	41	D	64.2	0.497	31.3	C	59.7
	R	0.726	44.8	D	28.2	0.682	31.7	C	32.4
North: North Lake Road	L	0.142	6.7	A	0	0.131	6.7	A	0
	T	0.4	46.6	D	40.4	0.852	56.6	E	68.3
	R	0.146	48.5	D	13.9	0.343	52.4	D	20.8
West: South Street	L	0.097	6.7	A	0	0.094	6.7	A	0
	T	0.907	70.2	E	110.7	0.824	50.2	D	84.4
	R	0.935	91.2	F	34.4	0.856	66.5	E	51.2
All vehicles		0.935	49.6	D	123	0.856	40.9	D	84.4

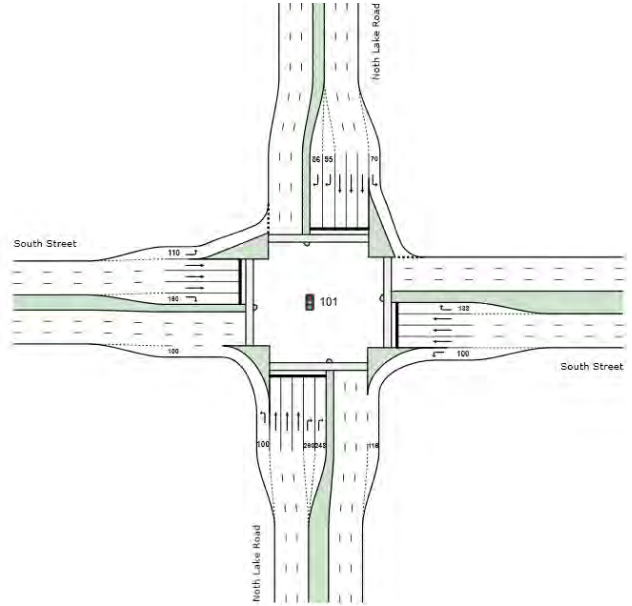
Table 7-9 SIDRA Analysis – South Street / North Lake Road – Existing Geometry (2031 Background Regional + Ultimate Development)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: North Lake Road	L	0.176	6.7	A	0	0.123	6.7	A	0
	T	0.92	77.4	E	165.6	0.792	66.6	E	94
	R	0.942	94.1	F	146.5	0.936	94.8	F	121.3
East: South Street	L	0.204	6.7	A	0	0.27	6.7	A	0
	T	0.514	45	D	83.1	0.53	42.3	D	91.1
	R	0.816	52.6	D	37.9	0.705	40.1	D	47.9
North: North Lake Road	L	0.324	27.3	C	54.4	0.292	24.6	C	47.7
	T	0.42	51	D	55	0.943	89.4	F	134.9
	R	0.203	58.7	E	21.7	0.388	65.4	E	37.9
West: South Street	L	0.191	17.2	B	27	0.188	15.3	B	24.7
	T	0.947	87.3	F	171.4	0.947	86.7	F	176.1
	R	0.966	110.2	F	47.9	0.915	93.1	F	84.7
All vehicles		0.966	61.3	E	171.4	0.947	62.3	E	176.1

Table 7-10 SIDRA Analysis – South Street / North Lake Road – Existing Geometry (Ultimate Scenario)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: North Lake Road	L	0.176	6.7	A	0	0.123	6.7	A	0
	T	0.942	84.7	F	172.9	0.792	66.6	E	94
	R	0.963	102	F	156.8	0.957	101.4	F	134.2
East: South Street	L	0.2	6.7	A	0	0.248	6.7	A	0
	T	0.477	43.6	D	77	0.499	41.5	D	84.8
	R	0.816	52.2	D	37.5	0.691	40.7	D	43.7
North: North Lake Road	L	0.339	28.1	C	57.4	0.321	26.5	C	53.9
	T	0.432	51.9	D	55.6	0.947	90.4	F	136.2
	R	0.203	58.7	E	21.7	0.374	64.3	E	37.5
West: South Street	L	0.19	17.6	B	27.4	0.184	14.6	B	23.6
	T	0.941	84.5	F	172.5	0.967	94	F	193.3
	R	0.966	110.2	F	47.9	0.963	107.1	F	91.8
All vehicles		0.966	63.4	E	172.9	0.967	65.9	E	193.3

Figure 7-4 South Street / North Lake Road – Existing Intersection Layout



7.7.3 South Street / Main Street

The existing South Street / Main Street intersection is a mid-block access point to the Kardinya Shopping Centre. A network analysis for the intersection, representing a staged crossing and including interactions with the upstream signals at South Street / North Lake Road.

The SIDRA Analysis results shown in **Table 7-12** and **Table 7-13** indicate poor service operation for right turn in and out of the intersection, for both AM and PM peak periods. However, **Table 7-11** indicates that the intersection is currently performing unsatisfactorily during the peak periods.

Table 7-11 SIDRA Analysis – South Street / Main Street – Existing Geometry (2020 Background)

Intersection Approach		PM peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
East: South Street	R	0.63	34.3	D	8.1	0.435	22	C	5.2
	T	0.211	0	A	0	0.262	0	A	0
North: Main Street	L	0.126	7.3	A	1.4	0.115	6.6	A	1.2
	R	0.902	106.3	F	14.3	1.267	331.8	F	67.7
West: South Street	L	0.083	7	A	0.8	0.093	7	A	1
	T	0.266	2.2	A	0	0.216	0	A	0
All vehicles		0.370	10	A	14.3	1.267	28.1	C	67.7

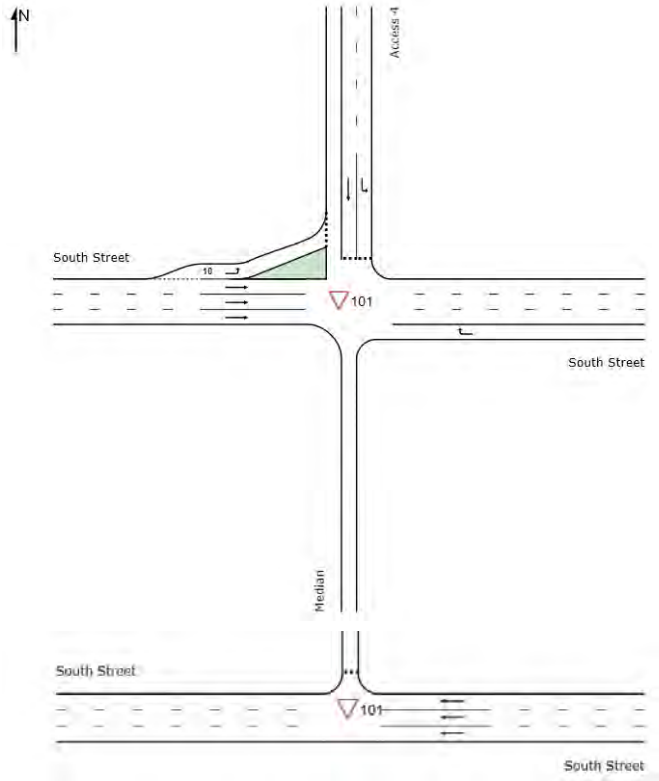
Table 7-12 SIDRA Analysis – South Street / Main Street – Existing Geometry (2031 Background + Development)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
East: South Street	R	0.599	50.2	F	7	0.928	90.5	F	19.7
	T	0.261	0	A	0	0.304	0	A	0
North: Access 4	L	0.083	3.7	A	0.9	0.198	3.9	A	2.4
	R	0.463	74.2	F	5	1.127	251.9	F	35
West: South Street	L	0.036	7.7	A	0.4	0.068	7.9	A	0.7
	T	0.347	0	A	0	0.336	0	A	0
All vehicles		0.298	3.4	A	7	1.127	15.7	A	35

Table 7-13 SIDRA Analysis – South Street / Main Street – Existing Geometry (Ultimate Scenario)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
East: South Street	R	0.64	55.9	F	7.6	1.081	174.4	F	40.1
	T	0.25	0	A	0	0.276	0	A	0
North: Access 4	L	0.085	3.8	A	1	0.207	4.2	A	2.5
	R	0.584	89.4	F	6.6	1.232	333.3	F	50
West: South Street	L	0.038	7.7	A	0.4	0.072	7.9	A	0.7
	T	0.355	0	A	0	0.355	0	A	0
All vehicles		0.325	4.1		7.6	1.232	23.8		50

Figure 7-5 South Street / Main Street Access – SIDRA Intersection Layout



7.7.4 South Street / Gilbertson Road

The South Street / Gilbertson Road intersection is a major connection to the residential area on the eastern section of the Activity Centre. The SIDRA Analysis results shown in **Table 7-15** indicates that performance may deteriorate to LoS F at this intersection, due to the increase of regional traffic. To alleviate the impact of these changes, road widening on Gilbertson Road is proposed to allow for the provision of a dedicated left turn, through and right turn legs. This proposal potentially allows for a reduction in green time on Gilbertson Road, which will allow improvements in the performance of regional traffic flow along South Street as shown in **Figure 7-6** and **Table 7-16**.

However, it is noted in **Table 7-17** that the upgraded intersection may result in significant delays at this intersection, due to the increase of residential traffic within the ACSP. The intersection performance could be significantly improved by modifying the signal phasing shown in **Figure 7-7**, as presented in **Table 7-18**.

This intersection functions as the primary connection between dense residential development and the primary road network. This analysis has taken into account the impacts of residents and employee mode shift for journey to work as describe in **Section 2.3.1** and **Section 2.3.2**.

However, the effects of parking constraints on residential trip generation have not been included in the results. The expectation is that reduced household size, combined with lower vehicle ownership rates would result in a significant reduction in residential trip generation. The scale of this impact depends greatly on the extent and application of policy changes in the Precinct. **Section 6.3.1** indicates the potential magnitude of this change could be in the order of a 60% decrease in daily vehicle trip generation per household.

Table 7-14 SIDRA Analysis – South Street / Gilbertson Road – Existing Geometry (2020 Background)

Intersection Approach		PM peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Road	L	0.511	51.2	D	70.4	0.745	62	E	50.1
	T	0.353	44.9	D	49.2	0.531	53.9	D	35.6
	R	0.401	54	D	36.8	0.461	58.5	E	26.4
East: South Street	L	0.529	37	D	124.6	0.787	42.8	D	190.5
	T	0.529	30.6	C	126.4	0.787	36.2	D	193.3
	R	0.357	36.6	D	15.9	0.399	34.4	C	18.6
North: Gilbertson Road	L	0.061	46.4	D	7.6	0.081	43.2	D	9.3
	T	0.212	43.4	D	28.7	0.228	40.1	D	28.5
	R	0.804	68.9	E	55.4	0.651	50.1	D	39.7
West: South Street	L	0.788	31.7	C	164.8	0.779	31.7	C	136.3
	T	0.788	25.2	C	166.4	0.779	25.2	C	138
	R	0.254	33.5	C	13.5	0.465	32	C	23.3
All vehicles		0.804	32.7	C	166.4	0.787	34.6	C	193.3

Table 7-15 SIDRA Analysis – South Street / Gilbertson Road – Existing Geometry (2031 Background + Development)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Road	L	0.752	63.7	E	75.8	0.438	62.3	E	45.9
	T	1.151	221.8	F	208.6	1.077	166.2	F	135.4
	R	1.151	226.3	F	208.6	1.077	170.7	F	135.4
East: South Street	L	1.131	208	F	285.7	1.125	199.1	F	398.4
	T	1.131	202.2	F	289.7	1.125	193.9	F	404.4
	R	1.048	150.9	F	83.2	1.081	136.7	F	117.2
North: Gilbertson Road	L	0.505	40	D	59.8	0.81	58.9	E	102.5
	T	0.505	35.4	D	59.8	0.81	54.2	D	102.5
	R	0.636	42.4	D	42.7	0.651	54.6	D	40.8
West: South Street	L	1.122	167.1	F	327.7	1.107	162.3	F	325.5
	T	1.122	160.6	F	331.3	1.107	156.1	F	329.8
	R	0.198	57.6	E	21.6	0.471	38	D	27
All vehicles		1.151	158.3	F	331.3	1.125	153.1	F	404.4

Figure 7-6 Modified Intersection Layout – South Street / Gilbertson Road

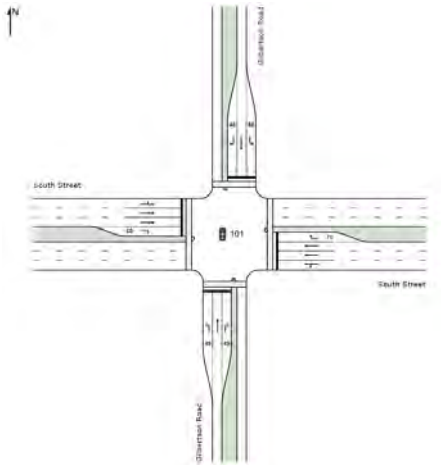


Table 7-16 SIDRA Analysis – South Street / Gilbertson Road – Modified Intersection (2031 Background + Development)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Road	L	0.962	101.9	F	98.2	0.96	105	F	63.6
	T	0.642	61.4	E	55.4	0.878	83.5	F	56
	R	0.625	68.2	E	43.6	0.728	81.9	F	32.2
East: South Street	L	0.787	58.1	E	144.9	0.781	44.5	D	184
	T	0.787	51.2	D	146.9	0.781	37.1	D	186.6
	R	0.973	112.2	F	70.2	0.953	99.5	F	106.5
North: Gilbertson Road	L	0.246	45.4	D	34.7	0.476	60.4	E	54.6
	T	0.186	39.8	D	26.9	0.361	54.1	D	42.3
	R	0.686	51.7	D	48.3	0.786	66.1	E	46.2
West: South Street	L	0.946	67.9	E	197.6	0.958	62.8	E	182
	T	0.946	61.2	E	199.6	0.958	56.5	E	184.2
	R	0.233	62.4	E	22.6	0.529	69.6	E	48.1
All vehicles		0.973	61.6	E	199.6	0.96	56	E	186.6

Table 7-17 SIDRA Analysis – South Street / Gilbertson Road – Modified Intersection (Ultimate Scenario)

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Road	L	1.111	193.9	F	179.4	1.102	187.6	F	105
	T	0.611	59.2	E	54.3	0.817	77.9	E	53.6
	R	0.995	125.1	F	87.9	0.974	115.5	F	50.5
East: South Street	L	1.124	201.7	F	287.9	1.083	166.1	F	382.9
	T	1.124	196.1	F	292.4	1.083	161.6	F	389.6
	R	1.069	165.3	F	110.8	1.131	211.5	F	227.7
North: Gilbertson Road	L	0.395	43.4	D	63.4	0.683	62.7	E	75.2
	T	0.165	35.2	D	25.3	0.361	54.1	D	42.3
	R	0.987	91.9	F	94.5	0.996	107.1	F	74.5
West: South Street	L	1.114	160.1	F	317.1	1.132	179.5	F	341.9
	T	1.114	153.5	F	321.2	1.132	173.8	F	347.8
	R	0.222	55.5	E	26	0.396	54.1	D	53.7
All vehicles		1.124	150.1	F	321.2	1.132	153.8	F	389.6

Figure 7-7 Modified Signal Phasing

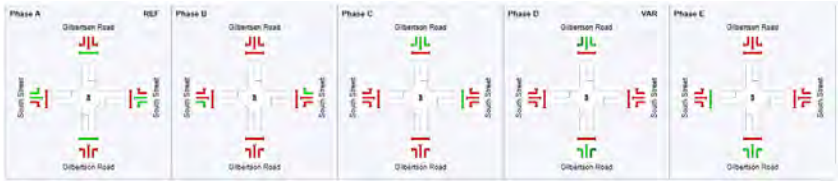


Table 7-18 SIDRA Analysis – South Street / Gilbertson Road – Modified Intersection – Modified Signal Data (Ultimate Scenario)

Intersection Approach		PM peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Road	L	1.009	129.9	F	199.8	0.68	64.2	E	80.6
	T	0.511	44.5	D	62.9	0.537	56.4	E	64.4
	R	0.745	58.6	E	73.1	0.723	72.8	E	53
East: South Street	L	0.668	37.9	D	146.3	0.953	82.5	F	394.9
	T	0.668	32	C	149	0.953	77.6	E	402.5
	R	1.027	148.9	F	145.7	0.998	128.6	F	253.5
North: Gilbertson Road	L	0.768	55.5	E	97.9	1.005	137.6	F	177.1
	T	0.315	42.7	D	37.3	0.518	56.3	E	62.4
	R	1.035	160.5	F	189.8	1.007	107.5	F	125.6
West: South Street	L	0.991	104.6	F	428.3	0.993	114.7	F	493.6
	T	0.991	99.1	F	433.6	0.993	109.4	F	501.9
	R	0.486	57.3	E	36.3	0.424	49.3	D	74.5
All vehicles		1.035	80.6	F	58.4	1.007	93.9	F	501.9

7.7.5 Gilbertson Road / Brophy Street

As shown in **Table 7-19,** the SIDRA analysis result for the Gilbertson Road / Brophy Street intersection is expected to perform satisfactorily on the existing intersection layout for both scenarios, as shown in **Table 7-19** and **Table 7-20**.

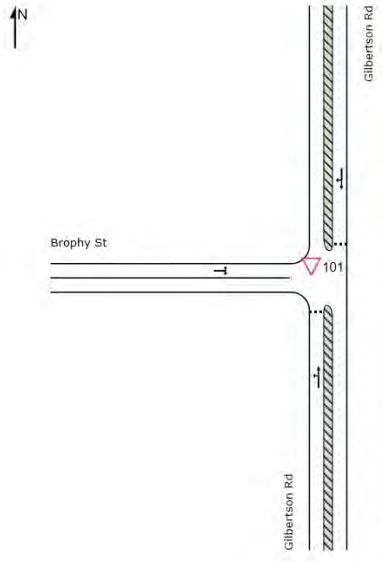
Table 7-19 SIDRA Analysis – Gilbertson Road / Brophy Street – Existing Geometry (2031 Background Regional + Ultimate Development)

Intersection Approach		PM Peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Rd	L	0.342	4.6	A	4.6	0.43	4.9	A	7.7
	T	0.342	4.8	A	4.6	0.43	6.3	A	7.7
North: Gilbertson Rd	T	0.285	2.4	A	4	0.326	2.9	A	4.2
	R	0.285	6.4	A	4	0.326	8.2	A	4.2
West: Brophy St	L	0.051	4.6	A	0	0.122	4.6	A	0
	R	0.051	4.6	A	0	0.122	4.6	A	0
All vehicles		0.342	3.9	A	4.6	0.43	4.9	A	7.7

Table 7-20 SIDRA Analysis – Gilbertson Road / Brophy Street – Existing Geometry (Ultimate Scenario)

Intersection Approach		PM Peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Rd	L	0.464	5.8	A	8	0.595	6.2	A	14
	T	0.464	6.9	A	8	0.595	8.2	A	14
North: Gilbertson Rd	T	0.428	2.6	A	6.1	0.382	3	A	5.2
	R	0.428	8.3	A	6.1	0.382	10.8	B	5.2
West: Brophy St	L	0.06	1.8	A	0	0.107	1.7	A	0
	R	0.06	2.2	A	0	0.107	2.1	A	0
All vehicles		0.464	4.6	A	8	0.595	5.6	A	14

Figure 7-8 Gilbertson Road / Brophy Street Intersection Layout



7.7.6 Gilbertson Road / Williamson Road

As shown in **Table 7-21,** the SIDRA analysis result for the Gilbertson Road / Brophy Street intersection is expected to perform satisfactorily on the existing intersection layout for both scenarios, as shown in **Table 7-21** and **Table 7-22.**

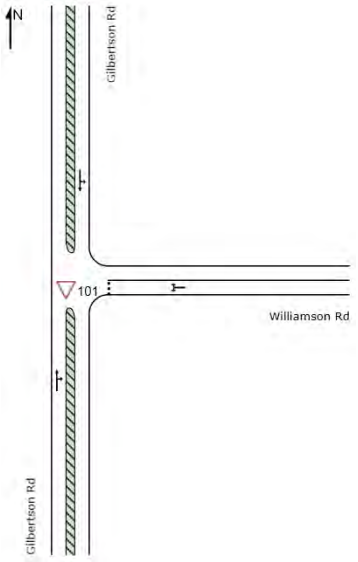
Table 7-21 SIDRA Analysis – Gilbertson Road / Williamson Road – Existing Geometry (2031 Background Regional + Ultimate Development)

Intersection Approach		PM Peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Rd	T	0.21	0.1	A	0.4	0.232	0.2	A	0.9
	R	0.21	4.7	A	0.4	0.232	4.7	A	0.9
East: Williamson Rd	L	0.045	5.7	A	0.5	0.024	5.6	A	0.2
	R	0.045	8.3	A	0.5	0.024	8.5	A	0.2
North: Gilbertson Rd	L	0.169	4.1	A	0	0.17	4.1	A	0
	T	0.169	0	A	0	0.17	0	A	0
All vehicles		0.21	0.5	A	0.5	0.232	0.5	A	0.9

Table 7-22 SIDRA Analysis – Gilbertson Road / Williamson Road – Existing Geometry (Ultimate Scenario)

Intersection Approach		PM Peak				SAT Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Gilbertson Rd	T	0.25	0.3	A	1.3	0.316	0.6	A	2.9
	R	0.25	5.4	A	1.3	0.316	5.4	A	2.9
East: Williamson Rd	L	0.159	6.3	A	1.7	0.08	5.9	A	0.8
	R	0.159	10.3	B	1.7	0.08	10.7	B	0.8
North: Gilbertson Rd	L	0.225	4.1	A	0	0.208	4.1	A	0
	T	0.225	0	A	0	0.208	0	A	0
All vehicles		0.25	1.4	A	1.7	0.316	1.3	A	2.9

Figure 7-9 Gilbertson Road / Williamson Road



8 Service / Loading

8.1 Service / Delivery

Freight and deliveries destined for the Activity Centre can take advantage of the high-capacity regional road network within the area, including South Street, North Lake Road, Leach Highway and Kwinana Freeway.

Commercial and retail deliveries are expected to be serviced by on-site loading docks or loading bays to limit the impact on boundary roads and conflicts between heavy vehicles and vulnerable road users.

8.2 Regional Road Freight

Kardinya Activity Centre's location along South Street, as well as its proximity to the O'Connor industrial area is likely to result in a high frequency of bypass freight trips. Long-term investigation of an alternative freight route to assist in improving road conditions in the vicinity, while reducing the intrinsic risks associated with operating in a mixed-traffic environment.

9 Conclusions

The Kardinya Activity Centre Structure Plan envisage to achieve a high-quality transport environment, where integrated network of transport modes encompassing private vehicles, public transport, cycling and walking modes are proposed.

Parking demand has been chosen as the focus for mode shift. Parking provision for both residential and commercial within the Activity Centre is proposed to be restricted to a maximum rate determined for general land uses, and partly offset through public provision.

For the purpose of this assessment, all internal trips between land uses within the Activity Centre, are assumed to be taken by non-car modes. However, for robust assessment, this reduction is only reflected onto non-residential traffic generation, with approximately 19% during the AM peak and 35% during the PM peak.

SIDRA analysis results show that the following intersections may perform unsatisfactorily upon the ultimate buildout of the Activity Centre:

- South Street / Main Street Intersection
- South Street / Gilbertson Road Intersection

However, this is mainly due to the growth of regional traffic carried along South Street.

South Street / Gilbertson Road intersection could be improved by upgrading the intersection layout and signal phasing. For South Street / Main Street intersection, signalisation in the future could be a solution to overcome the limited right out movement. However, this is not considered to be critical, as the traffic will choose to exit from another crossover if there's any significant queueing at the South Street / Main Street intersection.

Higher residential density which represents a higher number of public transport patrons will trigger the requirement for better public transport facilities, providing the impetus to accelerate the planning of the **high-capacity public transport** (**BRT/LRT) route connecting Kardinya Centre with Murdoch Station.**

The proposal within the ACSP will increase the residential density, which will then activate the need for this BRT/LRT. This proposal is expected to shift majority of the private vehicle traffic to public transport, which will result in major transport mode shift.

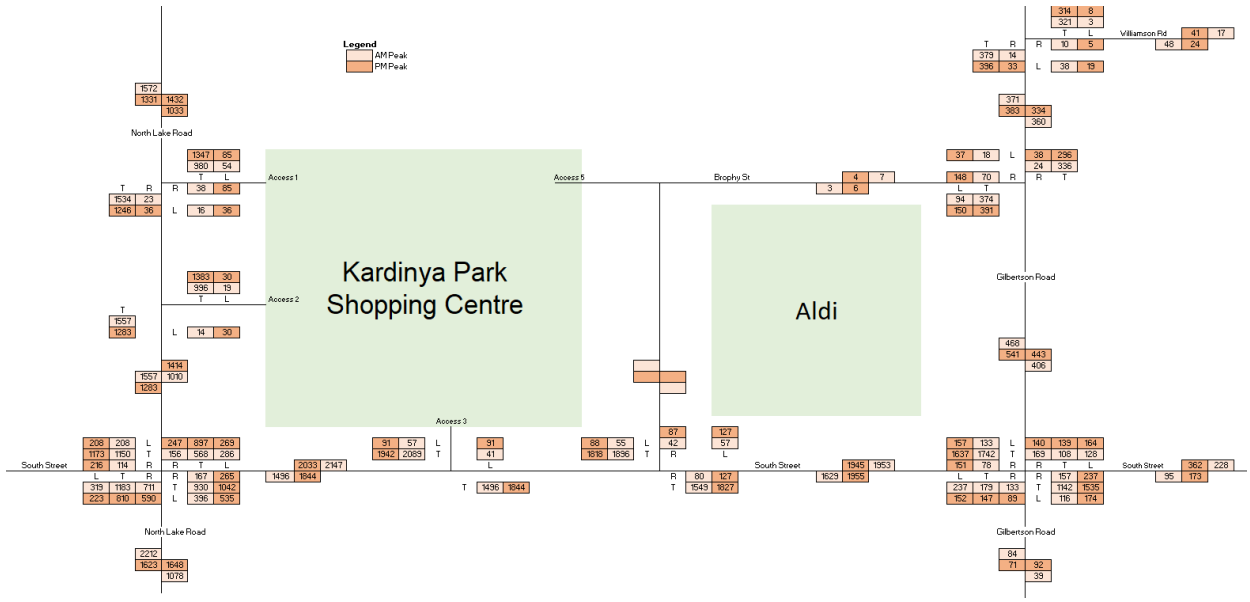
APPENDIX

A

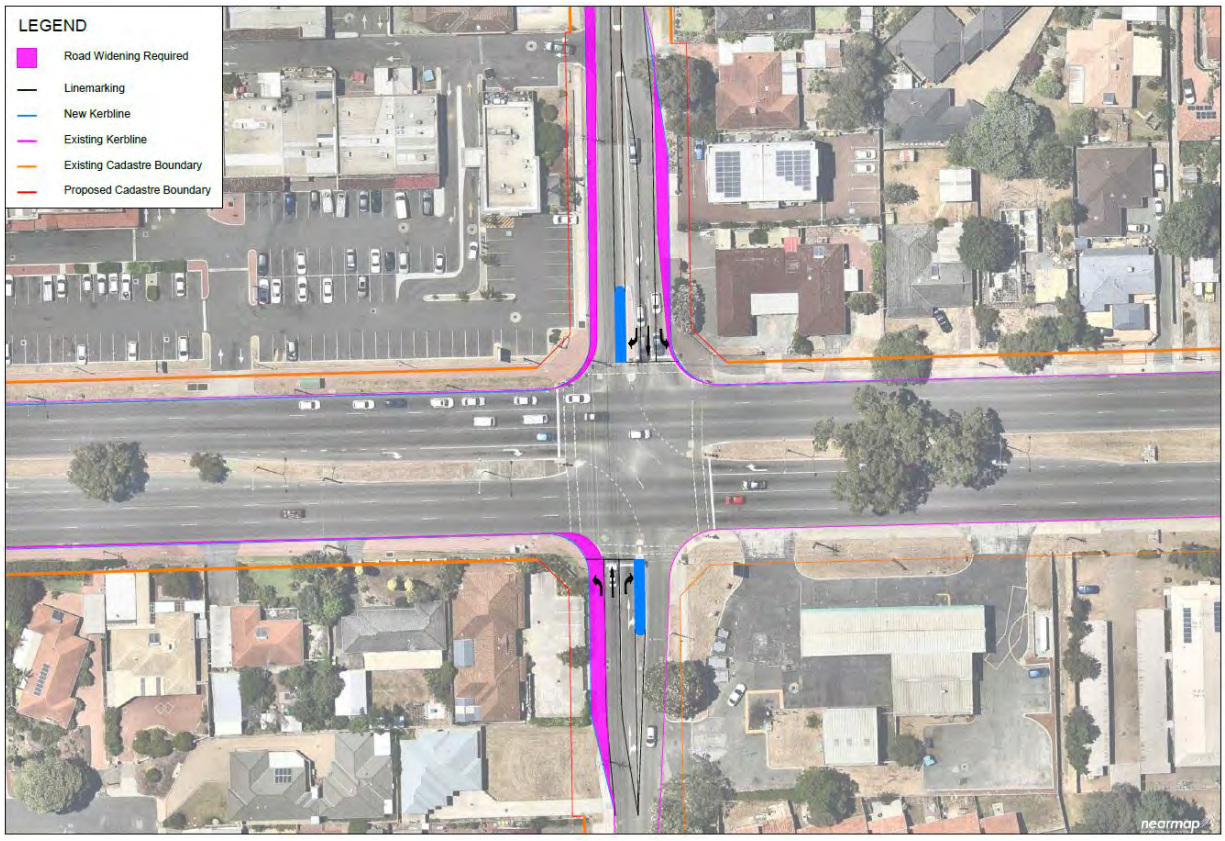
TRAFFIC DISTRIBUTION

APPENDIX B

SOUTH STREET / GILBERTSON ROAD INTERSECTION WIDENING




LEGEND
Land Take Required
Linemarking
New Kerbline
Existing Kerbline
Existing Cadastre Boundary
Proposed Cadastre Boundary
1
3
2.4
nearmap


LEGEND
Road Widening Required
Linemarking
New Kerbline
Existing Kerbline
Existing Cadastre Boundary
Proposed Cadastre Boundary
nearmap

Appendix 3: Pritchard Francis – Servicing Report

Kardinya Park Shopping Centre
Kardinya
Engineering Services Report

Project No: 19320

Table of Contents

Revision	Description	Author	Date
A	Issued For Review	Jamie De Palma	19 December 2019
B	Issued For Review	Jamie De Palma	6 January 2020
C	Stormwater Revised	Jamie De Palma	8 January 2020
D	Structure Plan Revised	Jamie De Palma	12 March 2020

1 General

At the request of Keith Somers on behalf of Dato Holdings Pty Ltd, Pritchard Francis has prepared this engineering servicing report to identify existing site conditions, existing services and potential upgrades required in order to facilitate the development of 1,856 dwellings within an approximate 500m radius of the existing Kardinya Park Shopping Centre.

The development area is located within the City of Melville and is centred about the existing Kardinya Park Shopping Centre which is boarded by South Street on the southern boundary, and North Lake Road on the western boundary. Figure 1 below depicts an aerial photograph of the area, whilst the proposed Local Structure Plan prepared by Element can be found within Appendix One.

Figure 1– 2019 Aerial photograph of the site

This report outlines the capacity of existing utility facilities to service the development. The services under assessment are:

- Water and Sewer Reticulation (Water Corporation WA)
- Drainage (City of Melville)
- Gas (Atco Gas Australia)
- Power (Western Power)
- Communications (Telstra and NBN Co)

In addition to utility service capacity assessment, the report also covers geology and preliminary earthworks advice for development.

2 Information Sources

The table below outlines the background and servicing information obtained by Pritchard Francis to facilitate this report.

Description of Data	Obtained From	Date
Dial Before You Dig	1100	7 November 2019
Site Survey	RM Surveys	8 November 2019
Aerial Imagery	Eagle View	8 November 2019
Groundwater Data	Department of Water	12 November 2019
Architectural Drawings	Hames Sharley	13 November 2019
Stormwater Drainage As Cons	Main Roads WA	14 November 2019
Water Corporation Data	Water Corporation	25 November 2019
Stormwater Drainage As Cons	City of Melville	26 November 2019
Structure Plan Proposal	Element	18 February 2020

3 Site Conditions

3.1 Geology

A geotechnical investigation of the site is yet to be completed and in lieu, Pritchard Francis have assessed the 1:50,000 Geological Map Series. The mapping indicates that the site is likely to consist of Sand comprising of pale yellowish brown, medium to course-grained sub-angular quartz, trace of feldspar, moderately sorted, of residual origin, which is typically suitable for urbanisation, excavation and of high permeability.

Based on our previous experience, we anticipate a site classification of class 'A' in accordance with AS 2870–2011 provided that normal site preparation is undertaken prior to construction.

An infiltration rate of 5m/day is anticipated as stormwater detention structures shall be located in the existing in-situ sand.

A detailed geotechnical investigation would need to be undertaken by a certified geotechnical engineer prior to construction to confirm site conditions and geological development constraints, if any at all. At completion of site work a final geotechnical inspection will be required and sign-off report produced in order for the local authority to provide clearances.

An extract of the Geological Map Series has been provided within Appendix Two.

3.2 Topography

In lieu of a site survey, Pritchard Francis have utilised the contours provided by the Water Corporation Esinet data. The development area includes some reasonable falls, with the levels being in the order of:

- RL 49m AHD at the western extent of the precinct (Callaway Court)
- RL 10m AHD at the northern extent of the precinct (Dalston Crescent)
- RL 23m AHD at the eastern extent of the precinct (South Street)
- RL 34m AHD at the southern extent of the precinct (Dixon Place)
- RL 22m AHD at the centre of the precinct (Kardinya Park Shopping Centre)

The site generally falls from the south-west to the north, with the north-western precinct comprising the steepest of the falls.

Minor earthworks and retaining walls to each individual development site would be likely to accommodate any change of level whilst mitigating any level difference between properties.

A detailed feature survey of the site will be required prior to any detailed documentation works being undertaken.

3.3 Acid Sulphate Conditions

Acid Sulphate Soils (ASS) are naturally occurring soils that contain iron sulphide minerals and are benign in undisturbed state below water table. When the soils get excavated or exposed to air, the sulphides react with oxygen to form sulphuric acid. Care and treatment must be undertaken when carrying out construction in areas with ASS.

In lieu of a geotechnical investigation, Pritchard Francis has assessed the Planning Bulletin to determine the Acid Sulphate Soil risk of the site. The mapping series indicates that the site has a low to no risk of Acid Sulphate Soils.

An extract of the Acid Sulphate Soils Risk Map is provided within Appendix Three.

3.4 Groundwater

The Department of Water indicate that the groundwater is likely to be encountered at RL 9.0m AHD in the eastern precinct of the development zone, reducing to RL 6.0m AHD in the western precinct.

Most of the development area is in excess of 10m from the groundwater and is therefore unlikely that the groundwater will impact the structural design, nor the stormwater detention solution for the development site.

However, the northern precinct where the natural surface falls to RL 10m AHD, may only have 2-3m of clearance to the groundwater. Groundwater in this precinct may impact the construction of basements and stormwater detention solutions.

An extract of the Groundwater Map is provided within Appendix Four.

3.5 Contamination

The Department of Water and Environmental Regulation contaminated site database indicates that no sites within the development area are registered as contaminated site. The publicly available database only lists sites classified as 'Remediated for restricted use', 'Contaminated – remediation required' and 'Contaminated – restricted use'.

3.6 Geomorphic Wetlands

The Department of Biodiversity, Conservation and Attractions Geomorphic Wetlands DBCA-019 database indicates that no sites within the development area are classified as geomorphic wetlands.

3.7 Bushfire Risk

The Department of Fire and Emergency Services (DFES) bushfire risk mapping indicates that no sites within the development area are in a bushfire prone area.

3.8 Heritage Considerations

The Department of Planning, Lands and Heritage (DPLH) aboriginal heritage mapping indicates that no sites within the development area are impacted by Heritage considerations.

4 Infrastructure

4.1 Sewerage Reticulation

The Water Corporation Esinet data obtained on 25 November 2019 indicates that the development area is located adjacent to the following sewer reticulation mains:

- All road reserves are currently serviced by Ø150mm and Ø225mm reticulation mains.
- Ø450mm sewer distribution main operates within the north-western precinct, discharging south-east.
- Ø600mm sewer distribution main operates within the central precinct, discharging south-east.
- Ø760mm sewer distribution main operated within the south-eastern, discharging south-east.
- All sewer reticulation mains north of South Street grade to the Le Souef Drive Pump Station. The pump station is charged via a 200mm rising main along North Lake Road, discharging into the Ø600mm sewer distribution main at South Street.
- All sewer reticulation mains south of South Street grade to the sewer distribution main.

The Water Corporation provided advice with respect to the sewer servicing on 18 December 2019, being:

- The reticulation infrastructure in the catchment the subject area is within can cater for the increase in predicted flows.
- The Le Suoef Dr pump station that serves the catchment and some downstream headworks (major infrastructure) will need to upgraded in the future.
- In regards to developers requirements, as per above there should be no upgrading of reticulation infrastructure but developers may be required to fund new, relocation and/or protection of works depending on the development proposal taking place.
- The upgrading of the headworks infrastructure will be funded by the Water Corporation.

This advice was subsequently confirmed with respect to the updated structure plan, provided on 9 March 2020:

- The update does not change the comments we made previously as informed below.
- The reticulation infrastructure in the catchment the subject area is within can cater for the increase in predicted flows.
- The Le Suoef Dr pump station that serves the catchment and some downstream headworks (major infrastructure) will need to upgraded in the future.
- In regards to developers requirements, as per above there should be no upgrading of reticulation infrastructure but developers may be required to fund new, relocation and/or protection of works depending on the development proposal taking place.
- The upgrading of the headworks infrastructure will be funded by the Water Corporation.

The advice from the Water Corporation confirms that the proposed structure plan amendment can be supported by the existing sewer reticulation infrastructure.

Refer to Appendix Five which contains a plan of the existing sewer infrastructure and Water Corporation correspondence.

4.2 Water Reticulation

The Water Corporation Esinet data obtained on 25 November 2019 indicates that the development area is surrounded by the following water reticulation mains:

- All road reserves are currently serviced by Ø100mm, Ø150mm and Ø200mm reticulation mains.
- Ø375mm water distribution main operates within the north-western precinct, continuing to the east.
- Ø375mm water distribution main operates within the northern precinct, continuing to the east.
- Ø305mm water distribution main operates within the Gilbertson Road.
- Ø760mm water distribution main operates within the south-eastern precinct, within both South Street and Gilbertson Road.

The Water Corporation provided advice with respect to the water servicing on 2 December 2019, being:

- By the way some good news, water does not seem to be a problem.

The advice from the Water Corporation confirms that the proposed structure plan amendment can be supported by the existing water reticulation infrastructure.

A hydraulic consultant will be required to assess each individual development site in order to:

- Size the water and fire connections to the development site.
- Review the water pressure and flow within the existing water mains to verify whether pumps and tanks are necessary to support a proposed development.

Refer to Appendix Six which contains a plan of the existing water infrastructure.

4.3 Stormwater Drainage Strategy

4.3.1 City of Melville Drainage Infrastructure

The City of Melville stormwater data obtained on 26 November 2019 indicates that the development area is surrounded by the following stormwater assets:

- Stormwater assets within the northern precinct typically grade to the Laurie Withers Reserve and Jack Martin Reserve.
- Stormwater assets within the eastern precinct appear to grade towards Morris Buzacott Reserve.
- Stormwater assets within the southern precinct typically grade to Gilbertson Road, and south towards Red Gum Park.
- Stormwater assets within South Street are controlled by Main Roads WA, which ultimately discharge into the Gilbertson Road drainage system.

Pritchard Francis anticipate that an upgrade to the existing road reserve drainage networks would not be required, and all stormwater networks would be appropriately sized to cater for the existing land uses and road reserve widths. An increase to the residential zoning will not impose additional load on the existing stormwater networks as per Section 4.3.2 below.

Refer to Appendix Seven which contains a plan of the existing stormwater infrastructure.

4.3.2 City of Melville Drainage Requirements

The City of Melville website defines that all developments shall contain stormwater on site in accordance with the City of Melville detention requirements. The detention requirements differ subject to the development type.

Residential Development

- All stormwater shall be retained and discharged on site.
- All soak-wells installed in paved or concrete areas shall be provided with trafficable lids and made accessible for maintenance purposes.
- Soak-wells to be no closer than 1.0m to a footing or boundary.
- All soak-wells used shall be from an accredited supplier.
- All soak-wells installed within flexible pavement areas (bitumen or brick paving) shall be provided with an appropriate base to prevent any subsidence of the well liners.
- It is the owner's responsibility to regularly clean and maintain on-site drainage systems to ensure its on-going functionality.
- Residential sites located below road level shall have drainage systems designed to cater for a 1:100 ARI 24hr storm event.
- Residential sites located above road level shall have drainage systems designed to cater for a 1:20 ARI 1hr storm event.

Industrial and Mixed Use

- All drainage systems designed for the proposed developments shall be certified by a Registered Professional Engineer.
- The design of the systems, shall conform to the requirements of the Building Code of Australia (BCA) and the Australian Standard (AS 3500).
- It shall be the Engineer's responsibility to demonstrate that a 1:100 ARI 24hr storm event is fully contained within the property boundary.

A copy of the stormwater detention requirements is provided within Appendix Eight.

4.4 Gas Supply

A Dial Before You Dig investigation indicates that there is existing gas infrastructure within the vicinity of the proposed structure plan amendment. All road reserves are fed with medium-low to medium pressure pipelines.

Atco Gas provided advice with respect to the gas servicing on 12 March 2020, being:

- Currently, part of the distribution network in Kardinya is reticulated in Medium Low Pressure (MAOP 7kPa) and this will be rationalised to Medium Pressure (MAOP 70kPa) in 2020.
- The gas distribution network in this area of interest in the suburb of Kardinya is currently going through a program to rationalise the gas pressure. Once completed (total completion by 2021) the gas network in this area will be able to supply a total of approximately 1900 dwellings.

The advice from Atco Gas confirms that the proposed structure plan amendment can be supported by the existing and planned upgrades of the gas infrastructure.

Refer to Appendix Nine which contains a plan of the existing gas infrastructure and Atco Gas correspondence.

4.5 Electrical Supply

A Dial Before You Dig investigation indicates that there is existing Western Power infrastructure within the vicinity of the proposed structure plan amendment. The following Western Power assets are located around the development area:

- Existing 66kVa overhead transmission line within the eastern verge of North Lake Road.
- High Voltage overhead cables within the southern verge of South Street, western verge of Gilbertson Road and western verge of North Lake Road.
- Typical High Voltage feeders within the residential streets.

Pritchard Francis engaged with 3E Electrical to seek further electrical advice, with the following comments received:

Background

The proposed development of the Kardinya Shopping Centre precinct, resulting in the increase in dwelling density by an additional 1521 dwellings. Based on the assumption that we have 75%/25% group housing/multi-story dwelling and green title development works. The additional load that will be added to the network will be approximately 6.5MVA of design load. Network feeders are designed to cater for 10MVA of actual load, and some provision for growth.

Existing and Proposed Power Infrastructure

The area is fed by the O'Connor zone substation located at the Garling St and Bowen St intersection, with HV distribution feeders all throughout this area. A mixture of aerial and underground HV feeder cables are available to connect/extend as the area develops. The spare capacity in the zone substation is between 25 – 30MVA, which is more than enough to cater for any expansion works in the surrounding suburbs. As the development area is within a couple of kms of the zone substation, tweaks to the existing network to shift load would be the first option for Western Power during the initial phases of the area upgrade.

In the past when additional load is added to the network at a slower rate, approximately 1.5MVA per year this has been considered load growth and thus any major network reinforcement works that maybe required to provide the capacity in the area is covered by Western Power.

Based on the overall load profile and probably staged development of the area, large network costs would not likely be incurred.

The Dial Before You Dig data has been provided within Appendix Ten.

4.6 Communications

A Dial Before You Dig investigation indicates that there is existing communications infrastructure within the vicinity of the proposed structure plan amendment. The following assets are located around the development area:

- Telstra Cables within all road reserves,
- Optus fibre optic within the northern verge of South Street, western and eastern verge of North Lake Road,
- Nextgen within the northern verge of South Street,
- NBN within all road reserves.

Pritchard Francis engaged with 3E Electrical to seek further communication advice, with the following comments received:

3E Communications Advice

The proposed redevelopment is located within a suburb that has already been converted to NBN Co broadband under the Brownfields Rollout. Therefore, NBN Co would be regarded as the infrastructure provider of last resort (IPoLR) and could be engaged, if the Developer/s so wanted, for the provision of broadband and voice infrastructure. If not, either of the niche Service Providers could be engaged. Under the Definitive Agreements with NBN Co, Telstra is not permitted provide broadband or voice infrastructure on its copper network for a period of 20 years, from the time of the agreement.

Developers have two obligations in relation to telecommunications:

- Firstly, to provide fibre ready pit and pipe, a requirement under the Telecommunications Act 1997
- Secondly, to provide telecommunications infrastructure, as is provided for other utilities, a requirement of the Federal Government's Telecommunications in New Developments Policy.

Although the fibre ready requirement applies strictly to Developers who are statutory corporations, we recommend that all Developers comply.

Although the existing NBN Co technology within Kardinya is Fibre to the Node (FTTN), given the increase in yield, NBN Co would most likely deliver fibre to the Premises (FTTP) technology, if the redevelopment were not to take place over an extended period of time. If the development were to be undertaken by a single Developer then NBN Co would most likely lean towards an FTTP solution. However, if multiple Developers were involved, ie primarily individual home owners, then it would be more difficult to obtain an FTTP solution. Assuming a mix of development by multiple home owners and land Developers, the probability of FTTP being delivered would be increased. A consortium of Developers could approach NBN Co under the Technology Choice Programme seeking the provision of FTTP or an approach could be made to NBN Co seeking their funding of the network upgrade, given the expected increase in yield and the consequential inadequacy of the FTTN network. NBN Co would take such as decision on commercial basis.

Major roads within the proposed redevelopment area, such as South St, North Lake Rd, Gilbertson Rd, are well serviced with large conduit routes but most other streets would not be regarded as fibre ready, since many are only serviced with P20 or P35 pipe, neither of which could support a substantial increase in cable infrastructure – see Telstra DBYD attached. Such streets would need to be upgraded to fibre ready standards. It should be noted that some existing conduit routes are constructed of asbestos composite material and that telecommunications carriers works and costs could reflect the precautions needed to be taken when upgrading networks through those routes.

Assuming road reserves are unchanged, we would not foresee telecommunications relocation works arising from the redevelopment but if alterations were made to road reserves, then a number of telecommunications carriers could be affected, ie Optus, Nextgen, Pipe Networks, NBN Co and Telstra. If road reserves we to be altered we recommend that such changes be implemented without compromising the standard alignments designated within the Utility Providers Code of Practice.

Apart from the costs associated with the upgrade works above, we would not see any obstacle to the provision of the additional services to the development.

The communications Dial Before You Dig data has been provided within Appendix Eleven.

5 Conclusion

This report outlines the existing geotechnical conditions and existing road reserve services servicing the proposed structure plan amendment of Kardinya Park. Pritchard Francis confirm that the site is accessible and can be served with roads, electrical, water, sewer, gas, stormwater drainage and communications infrastructure.

Appendices

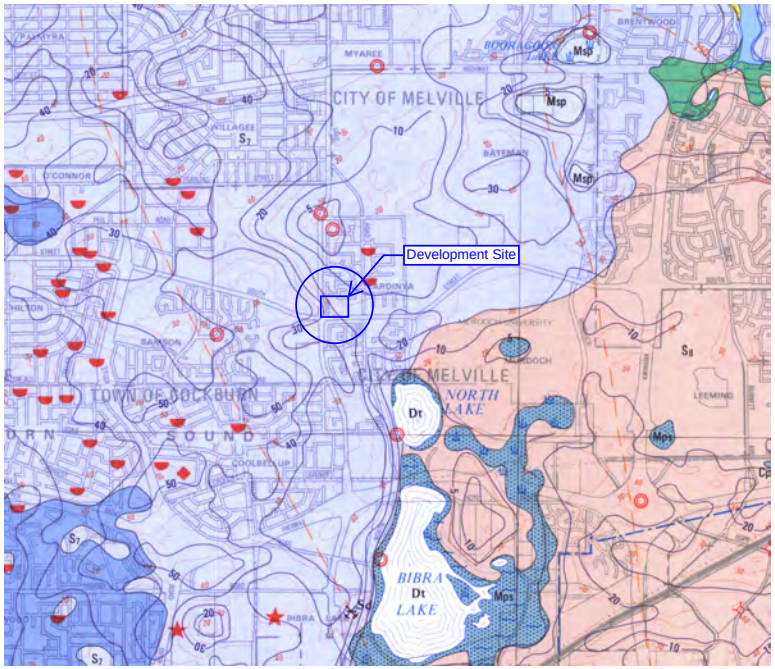
Appendix One:	Local Structure Plan
Appendix Two:	Geology
Appendix Three:	Acid Sulphate Soils Risk Map
Appendix Four:	Groundwater Mapping
Appendix Five:	Sewer Reticulation Infrastructure
Appendix Six:	Water Reticulation Infrastructure
Appendix Seven	Stormwater Infrastructure
Appendix Eight:	Stormwater Detention
Appendix Nine:	Gas Infrastructure
Appendix Ten:	Electrical Infrastructure
Appendix Eleven:	Communication Infrastructure

Appendix One: Local Structure Plan

Appendix Two: Geology

PERTH

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA



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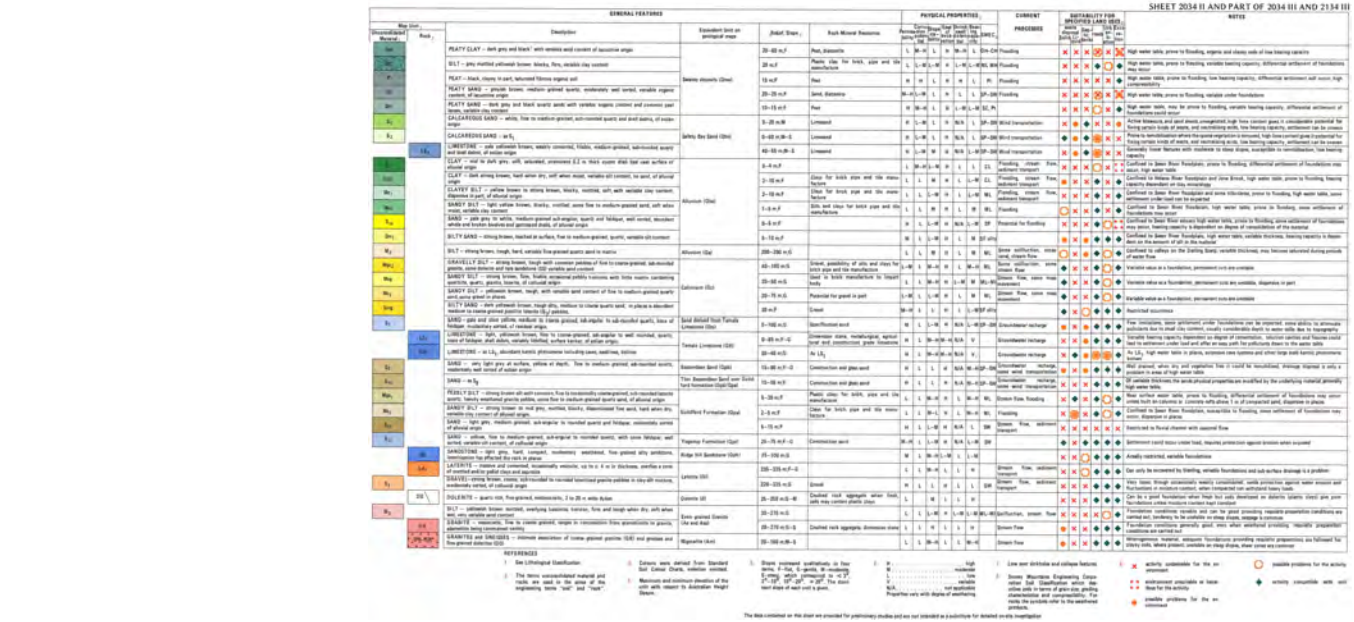
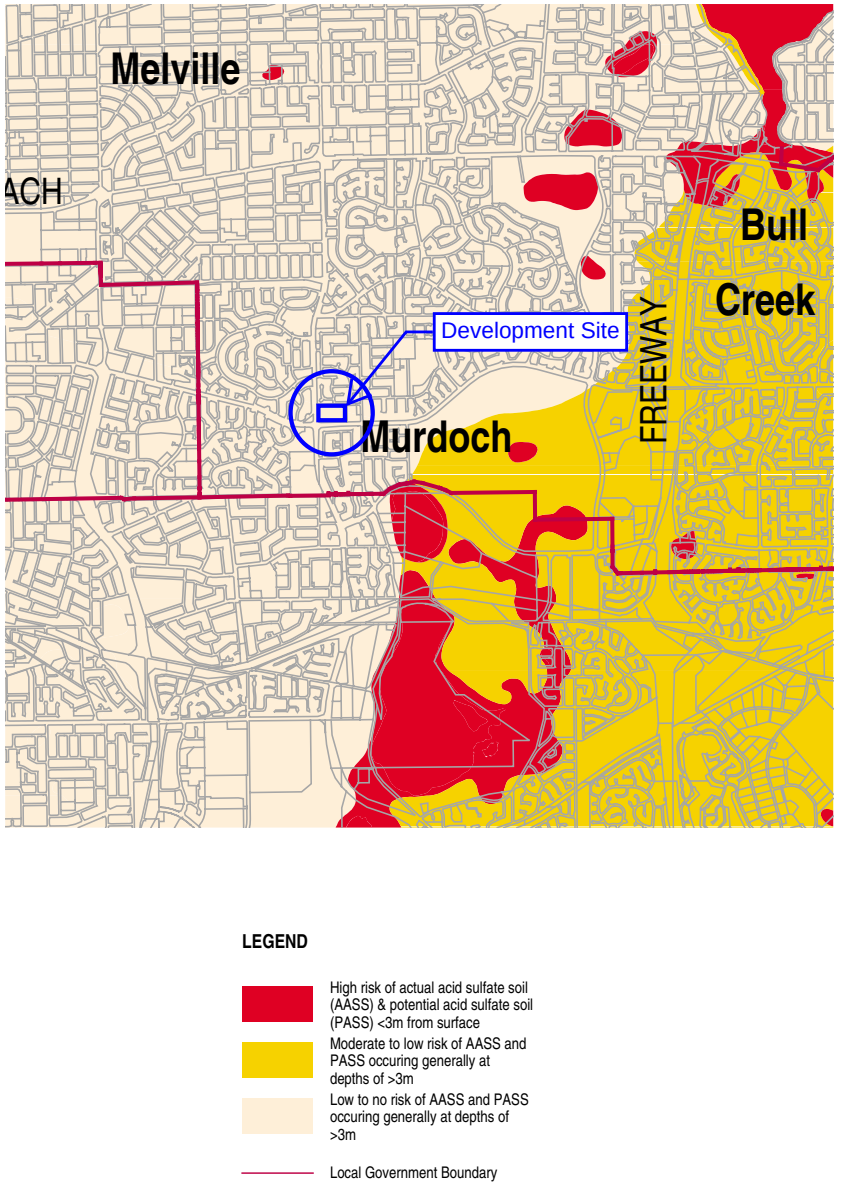


Appendix Three: Acid Sulphate Soils Risk Map

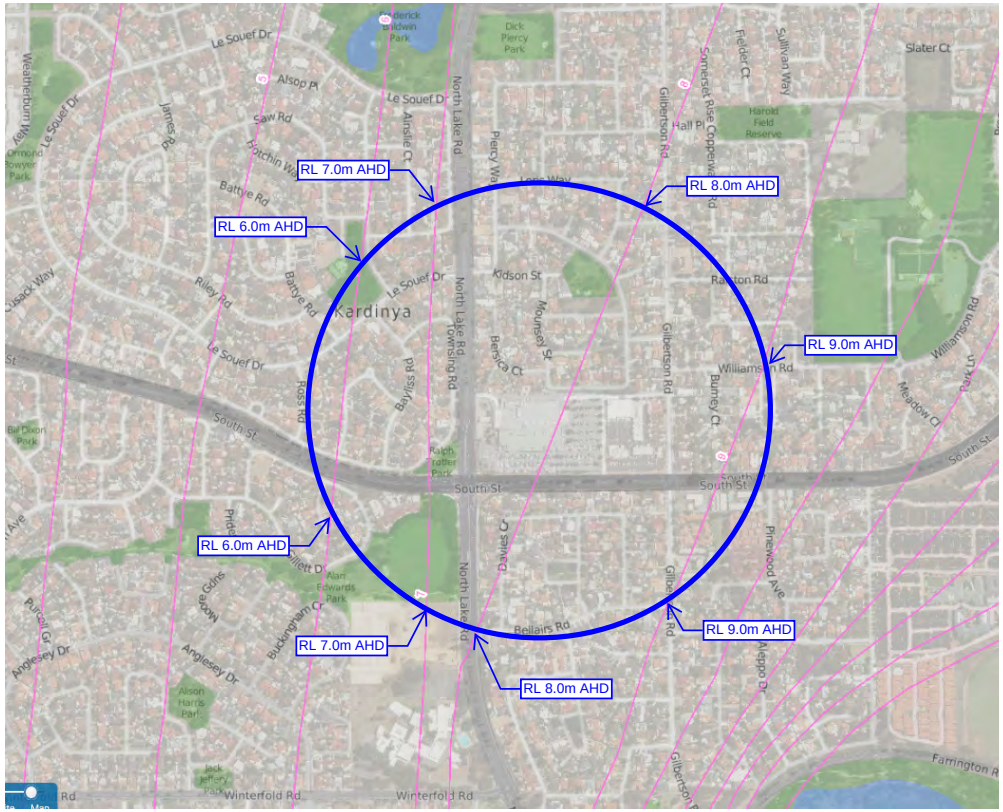
Planning Bulletin Number 64

Figure 3: Central Metropolitan Region Scheme Acid Sulfate Soils

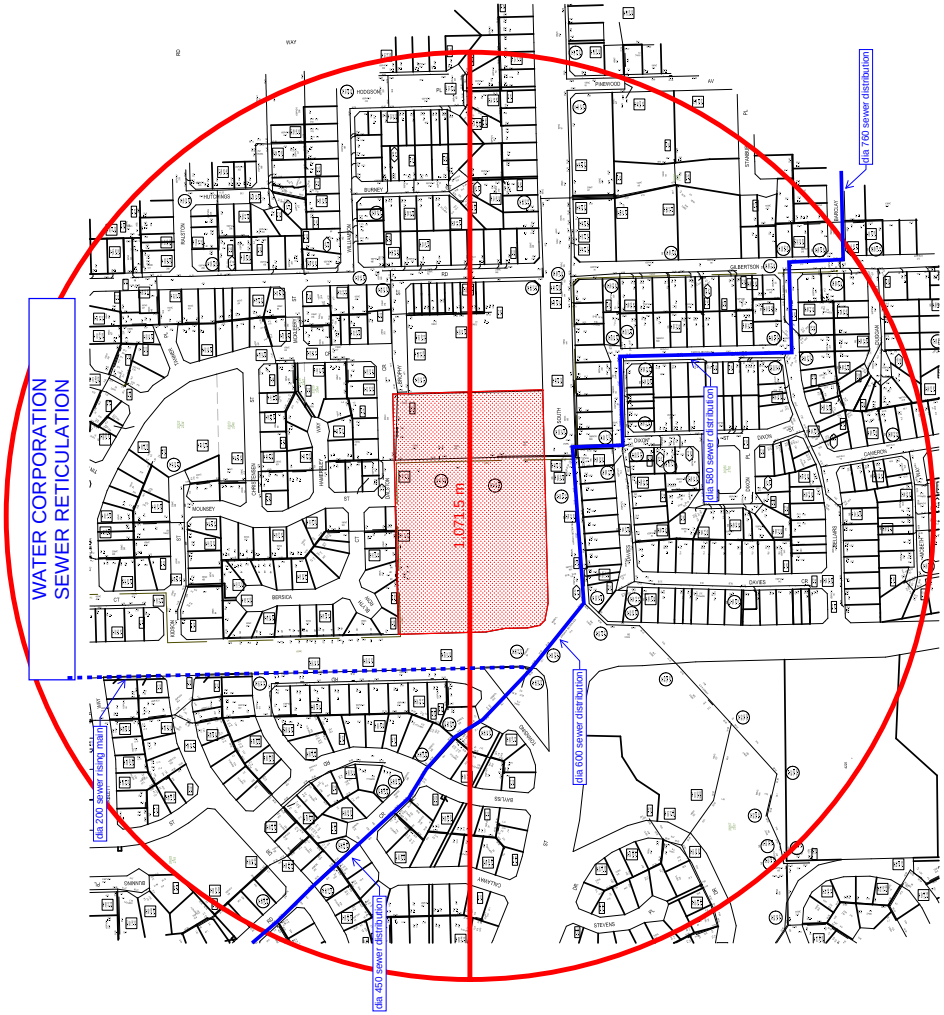


Appendix Four: Groundwater Mapping

DEPARTMENT OF WATER
GROUNDWATER



Appendix Five: Sewer Reticulation Infrastructure



Jamie De Palma

From: Kevin Purcher <Kevin.Purcher@watercorporation.com.au>
Sent: Monday, 9 March 2020 8:17 AM
To: Jamie De Palma
Subject: RE: South St Kardinya

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Kardinya

Hi Jamie

Thanks for the update with the expected yield. The update does not change the comments we made previously as informed below.

- The reticulation infrastructure in the catchment the subject area is within can cater for the increase in predicted flows.
- The Le Suoef Dr pump station that serves the catchment and some downstream headworks (major infrastructure) will need to upgraded in the future.

In regards to developers requirements, as per above there should be no upgrading of reticulation infrastructure but developers may be required to fund new, relocation and/or protection of works depending on the development proposal taking place.

The upgrading of the headworks infrastructure will be funded by the Water Corporation.

If you have any queries please ask.

Kevin Purcher
Snr Plnr - Land Planning
Development Services

E Kevin.Purcher@watercorporation.com.au
T (08) 9420 2385

From: Jamie De Palma [mailto:jamie.d@pfeng.com.au]
Sent: Wednesday, 19 February 2020 8:54 AM
To: Kevin Purcher
Subject: RE: South St Kardinya

Morning Kevin,

The planning consultant for the Kardinya Structure Plan has received feedback from the WAPC and City of Melville, and the development area has slightly expanded with an expected yield of 1,856 dwellings in lieu of 1,521. An increase of 335 dwellings.

Will the additional dwellings impact your previous assessment regarding water and sewer servicing?

Jamie De Palma
Associate - Civil
Pritchard Francis | T (08) 9382 5111

From: Kevin Purcher <Kevin.Purcher@watercorporation.com.au>
Sent: Wednesday, 18 December 2019 8:38 AM
To: Jamie De Palma <jamie.d@pfeng.com.au>
Subject: RE: South St Kardinya

Hi Jamie

Your email is perfectly timed. I just got a response from Planning last night. Please note the following.

- The reticulation infrastructure in the catchment the subject area is within can cater for the increase in predicted flows.
- The Le Suoef Dr pump station that serves the catchment and some downstream headworks (major infrastructure) will need to upgraded in the future.

In regards to developers requirements, as per above there should be no upgrading of reticulation infrastructure but developers may be required to fund new, relocation and/or protection of works depending on the development proposal taking place.

The upgrading of the headworks infrastructure will be funded by the Water Corporation.

If you have any queries please ask.

Regards

Kevin Purcher
Snr Plnr - Land Planning
Development Services

E Kevin.Purcher@watercorporation.com.au
T (08) 9420 2385

From: Jamie De Palma [mailto:jamie.d@pfeng.com.au]
Sent: Wednesday, 18 December 2019 7:46 AM
To: Kevin Purcher
Subject: RE: South St Kardinya

Hi Kevin,

Hope things are going well.

Just touching base to see how the planning review of the sewer reticulation is progressing? If you have any queries please call me.

Jamie De Palma
Associate - Civil
Pritchard Francis | T (08) 9382 5111

From: Kevin Purcher <Kevin.Purcher@watercorporation.com.au>
Sent: Tuesday, 3 December 2019 11:49 AM
To: Jamie De Palma <jamie.d@pfeng.com.au>
Subject: RE: South St Kardinya

Hi Jamie

Just to keep you updated the review of our scheme should be completed around the end of the December. I'll be on leave around then so if it comes before I go on leave that will be good but if not I will be getting back to you early January.

Regards

Kevin Purcher
Snr Plnr - Land Planning
Development Services

E Kevin.Purcher@watercorporation.com.au
T (08) 9420 2385

From: Kevin Purcher
Sent: Monday, 2 December 2019 2:44 PM
To: Jamie De Palma
Subject: RE: South St Kardinya

Thanks Jamie

Just what I needed. I'll arrange for a review of the Wastewater Planning.

Regards

Kevin Purcher
Snr Plnr - Land Planning
Development Services

E Kevin.Purcher@watercorporation.com.au
T (08) 9420 2385

From: Jamie De Palma [mailto:jamie.d@pfeng.com.au]
Sent: Monday, 2 December 2019 2:25 PM
To: Kevin Purcher
Subject: RE: South St Kardinya

Hi Kevin,

Comments in blue below.

Jamie De Palma
Associate - Civil
Pritchard Francis | T (08) 9382 5111

From: Kevin Purcher <Kevin.Purcher@watercorporation.com.au>
Sent: Monday, 2 December 2019 2:12 PM
To: Jamie De Palma <jamie.d@pfeng.com.au>
Subject: South St Kardinya

Hi Jamie

In regards to your query you sent us recently could you help with a bit more information.

Are the 1521 dwellings additional to the existing dwellings in the area or the total dwellings after development has occurred? The 1521 dwellings are the total amount of dwellings after development has occurred. There are about 300 dwellings within the structure plan already, so we are looking at 1221 additional dwellings.

Do you have an idea of the timing of the development (over how many years)? The increase in density is coming off the back of the $100M Kardinya Park Shopping Centre redevelopment. With the shopping centre to be completed in about 3 years, it would be fair to say that most of the dwelling increase will be 5-10 years away.

I will have to put this up to our Networks team to do a full review for the area because a quick desktop review looks like the Le Souef Dr WWPS would be under pressure and some connecting sewers may also be.

Could you also let me know what the drivers are for the query as the review of the planning has not been scheduled and it may take some time. Kardinya Park Shopping Centre was recently commissioned and a Development Application to the City of Melville will be submitted this month (December 2019). As a result of the shopping centre redevelopment, the client and City are keen to redevelop the surrounding precinct and create a hub.

BTW some good news, water does not seem to be a problem. Excellent. Thanks for confirming.

If you have a query please ask.

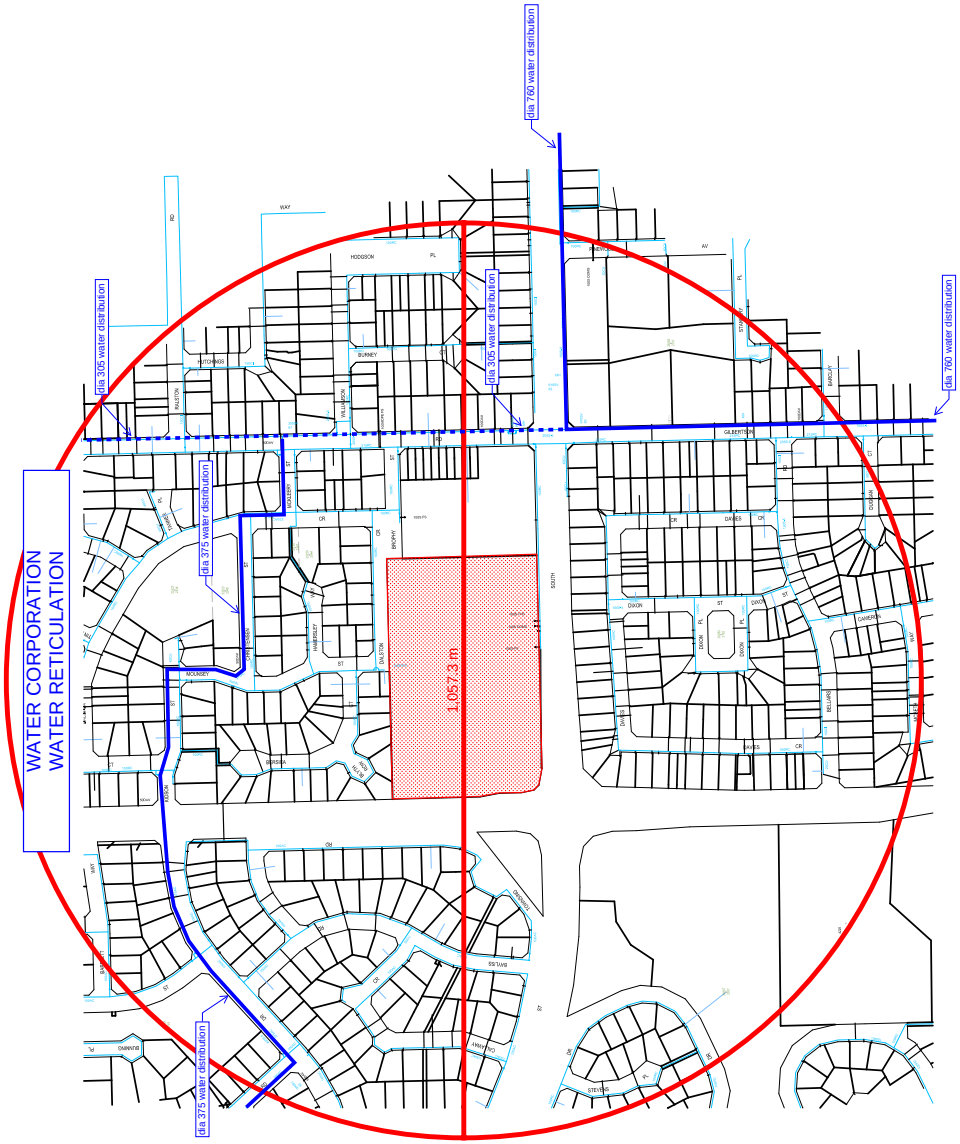
Regards

Kevin Purcher
Snr Plnr - Land Planning
Development Services

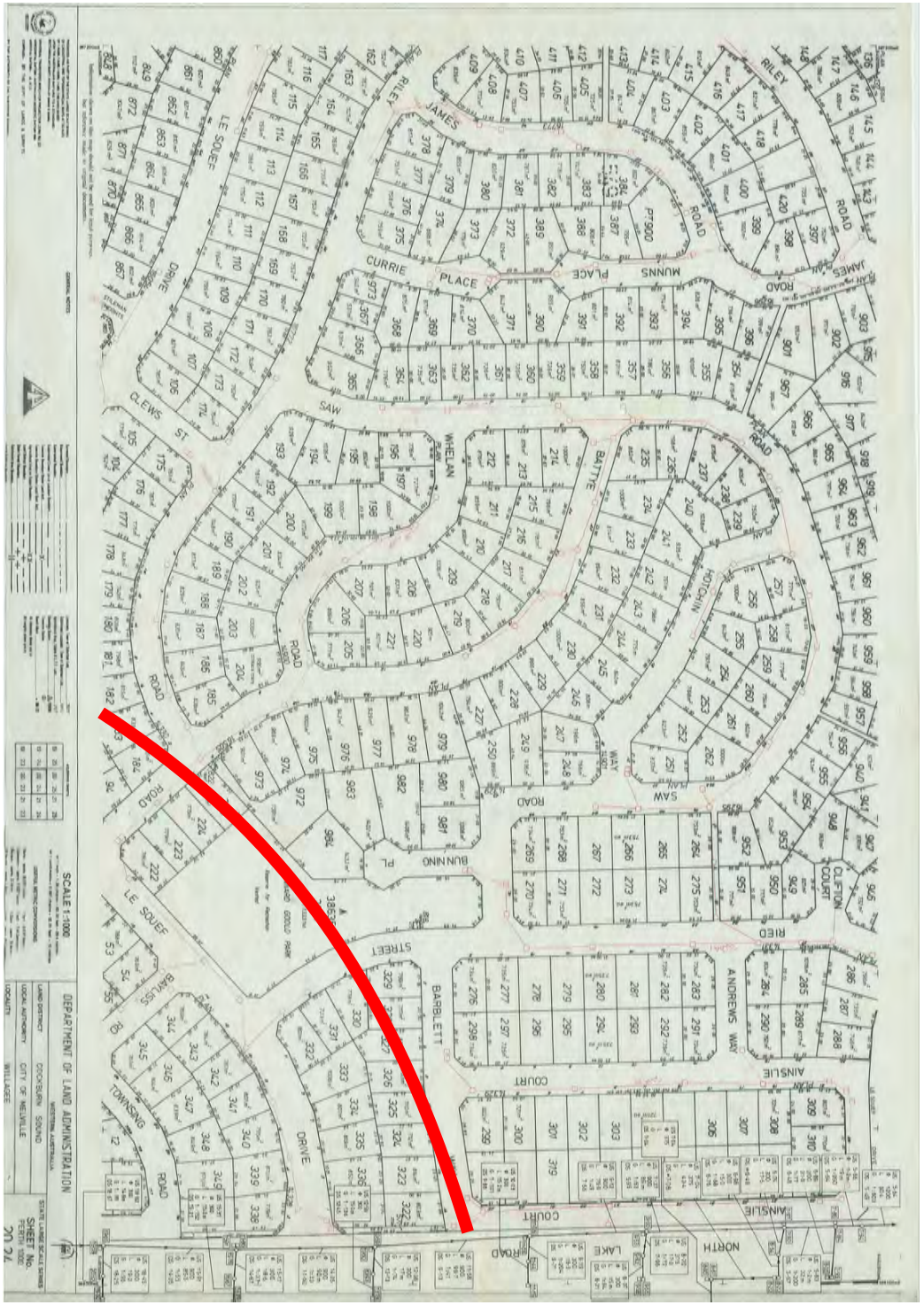
E Kevin.Purcher@watercorporation.com.au
T (08) 9420 2385

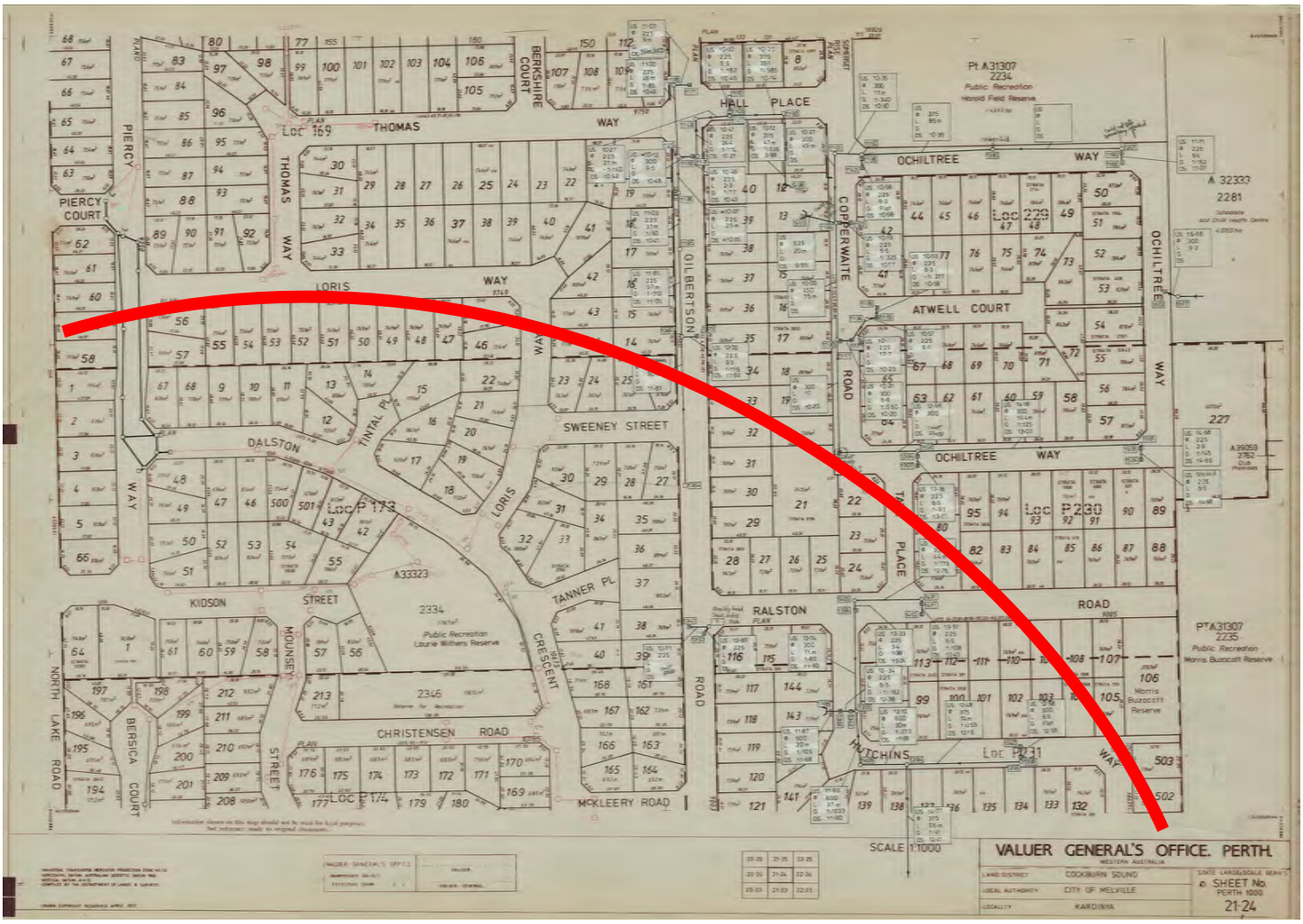
watercorporation.com.au

Appendix Six: Water Reticulation Infrastructure

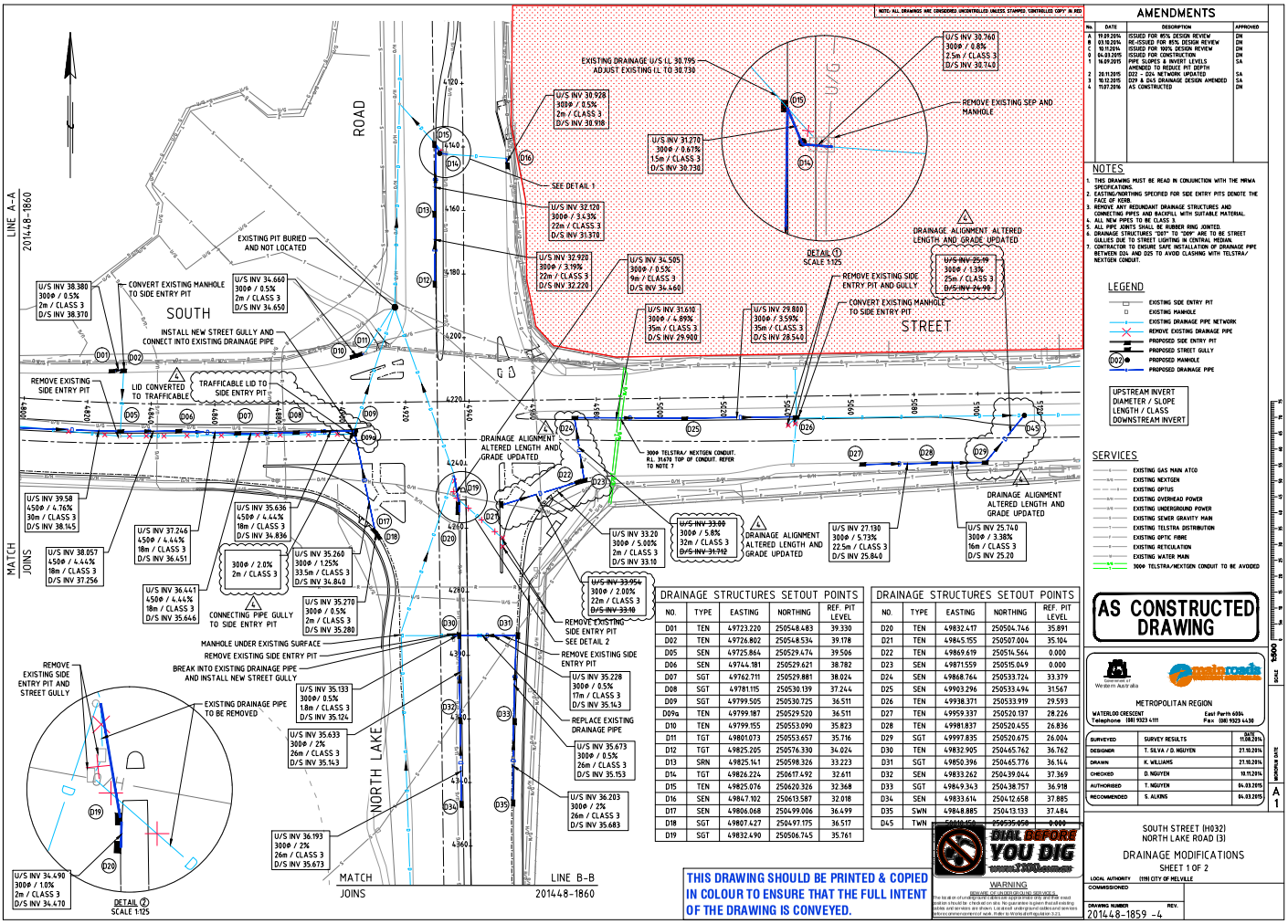


Appendix Seven Stormwater Infrastructure




PIERCY COURT
PIERCY
THOMAS WAY
Loc 159
THOMAS
BERKSHIRE COURT
HALL PLACE
Pt A31307
2234
Public Recreation
Harold Field Reserve
OCHILTREE WAY
A 32333
2281
COPPERWAITE ROAD
GILBERTSON WAY
LORIS WAY
ATWELL COURT
OCHILTREE WAY
SWEENEY STREET
DALSTON WAY
Loc P173
TINTAL PL
LORIS
A33323
KIDSON STREET
2334
Public Recreation
Laure Withers Reserve
MOUNSEA CRESCENT
TANNER PL
RALSTON ROAD
Loc P230
PLACE
ROAD
Pt A31307
2235
Public Recreation
Morris Buzacott Reserve
NORTH LAKE ROAD
BERSICA COURT
CHRISTENSEN ROAD
HUTCHINS WAY
Loc P231
McKLEERY ROAD
Loc P174
SCALE 1:1000
VALUER GENERAL'S OFFICE. PERTH.
WESTERN AUSTRALIA
LAND DISTRICT COCKBURN SOUND
LOCAL AUTHORITY CITY OF MELVILLE
LOCALITY KARDINYA
STATE LARGE SCALE SERIES
SHEET No.
PERTH 1000
21-24


COLEBATCH HILL
STILEMAN HEIGHTS
LE SOUEF
TOWNSHEND WAY
SOUTH
TOWNSING
ROSS DRIVE
BAYLISS CRESCENT
CALLAWAY ROAD
NORTH ROAD
LAKE
RALPH TROTTER PARK
WILSMORE GROVE
GARDENS
AVENUE
HADLEY
GILLETT
PETTERSON
SHANN GROVE
WOOD CT.
PRIDER COURT
JULL COURT
STEVENS PLACE
DRIVE
STREET
ROAD
549
ALAN EDWARDS PARK
A 36867
FRANK CANN PARK
A 36532
MORROW MEWS
MOORE GARDENS
SCALE 1:1000
VALUER GENERAL'S OFFICE. PERTH.
WESTERN AUSTRALIA
LAND DISTRICT COCKBURN SOUND
LOCAL AUTHORITY CITY OF MELVILLE
LOCALITY HILTON & WILLAGEE
STATE LARGE SCALE SERIES
SHEET No.
PERTH 1000
20.23



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D02	TEN	49726.802	250548.534	39.178
D05	SEN	49725.864	250529.474	39.506
D06	SEN	49744.181	250529.621	38.782
D07	SGT	49762.711	250529.881	38.024
D08	SGT	49781.115	250530.139	37.244
D09	SGT	49799.505	250530.725	36.511
D09a	TEN	49799.187	250529.520	36.511
D10	TEN	49799.155	250553.090	35.823
D11	SGT	49801.073	250553.657	35.716
D12	TGT	49825.205	250576.330	34.024
D13	SRN	49825.141	250598.326	33.223
D14	TGT	49826.224	250617.492	32.611
D15	TEN	49825.076	250620.326	32.368
D16	SEN	49847.102	250613.587	32.018
D17	SEN	49806.068	250499.006	36.499
D18	SGT	49807.427	250497.175	36.517
D19	SGT	49832.490	250506.745	35.761

NO.	TYPE	EASTING	NORTHING	REF. PIT LEVEL
D20	TEN	49832.417	250504.746	35.891
D21	TEN	49845.155	250507.004	35.104
D22	TEN	49869.619	250514.564	0.000
D23	SEN	49871.559	250515.049	0.000
D24	SEN	49868.764	250533.724	33.379
D25	SEN	49903.296	250533.494	31.567
D26	TEN	49938.371	250533.919	29.593
D27	TEN	49959.337	250520.137	28.226
D28	TEN	49981.837	250520.455	26.836
D29	SGT	49997.835	250520.675	26.004
D30	TEN	49832.905	250465.762	36.762
D31	SGT	49850.396	250465.776	36.144
D32	SEN	49833.262	250439.044	37.369
D33	SGT	49849.343	250438.757	36.918
D34	SEN	49833.614	250412.658	37.885
D35	SWN	49868.885	250413.133	37.484
D45	TWN	[illegible]	250535.958	0.000

THIS DRAWING SHOULD BE PRINTED & COPIED IN COLOUR TO ENSURE THAT THE FULL INTENT OF THE DRAWING IS CONVEYED.

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WARNING

AMENDMENTS

No.	DATE	DESCRIPTION	APPROVED
A	19.01.2015	ISSUED FOR 90% DESIGN REVIEW	DN
B	03.10.2014	RE-ISSUED FOR 90% DESIGN REVIEW	DN
C	04.11.2014	ISSUED FOR 100% DESIGN REVIEW	DN
0	04.03.2015	ISSUED FOR CONSTRUCTION	DN
1	16.09.2015	PIT SIZES & ENTRY LEVELS AMENDED TO REDUCE PIT DEPTH	SA
2	29.10.2015	D22 + D24 NETWORKS UPDATED	SA
3	10.12.2015	D29 & D45 DRAINAGE DESIGN AMENDED	SA
4	11.07.2016	AS CONSTRUCTED	DN

NOTES

1. THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE MRWA SPECIFICATIONS.
2. EASTING/NORTHING SPECIFIED FOR SIDE ENTRY PITS DENOTE THE FACE OF KERB.
3. REMOVE ANY REDUNDANT DRAINAGE STRUCTURES AND CONNECTING PIPES AND BACKFILL WITH SUITABLE MATERIAL.
4. ALL NEW PIPES TO BE CLASS 3.
5. ALL PIPE JOINTS SHALL BE RUBBER RING JOINTED.
6. DRAINAGE STRUCTURES "D01" TO "D09" ARE TO BE STREET GULLIES DUE TO STREET LIGHTING IN CENTRAL MEDIAN.
7. CONTRACTOR TO ENSURE SAFE INSTALLATION OF DRAINAGE PIPE BETWEEN D24 AND D25 TO AVOID CLASHING WITH TELSTRA/ NEXTGEN CONDUIT.

LEGEND

- EXISTING SIDE ENTRY PIT
- EXISTING MANHOLE
- EXISTING DRAINAGE PIPE NETWORK
- REMOVE EXISTING DRAINAGE PIPE
- PROPOSED SIDE ENTRY PIT
- PROPOSED STREET GULLY
- D02 PROPOSED MANHOLE
- PROPOSED DRAINAGE PIPE

UPSTREAM INVERT
DIAMETER / SLOPE
LENGTH / CLASS
DOWNSTREAM INVERT

SERVICES

- EXISTING GAS MAIN ATCO
- EXISTING NEXTGEN
- EXISTING OPTUS
- EXISTING OVERHEAD POWER
- EXISTING UNDERGROUND POWER
- EXISTING SEWER GRAVITY MAIN
- EXISTING TELSTRA DISTRIBUTION
- EXISTING OPTIC FIBRE
- EXISTING RETICULATION
- EXISTING WATER MAIN
- 3000 TELSTRA/NEXTGEN CONDUIT TO BE AVOIDED

AS CONSTRUCTED DRAWING

Main Roads Western Australia

METROPOLITAN REGION

WATERLOO CRESCENT, East Perth 6004
Telephone (08) 9323 4111 Fax (08) 9323 4430

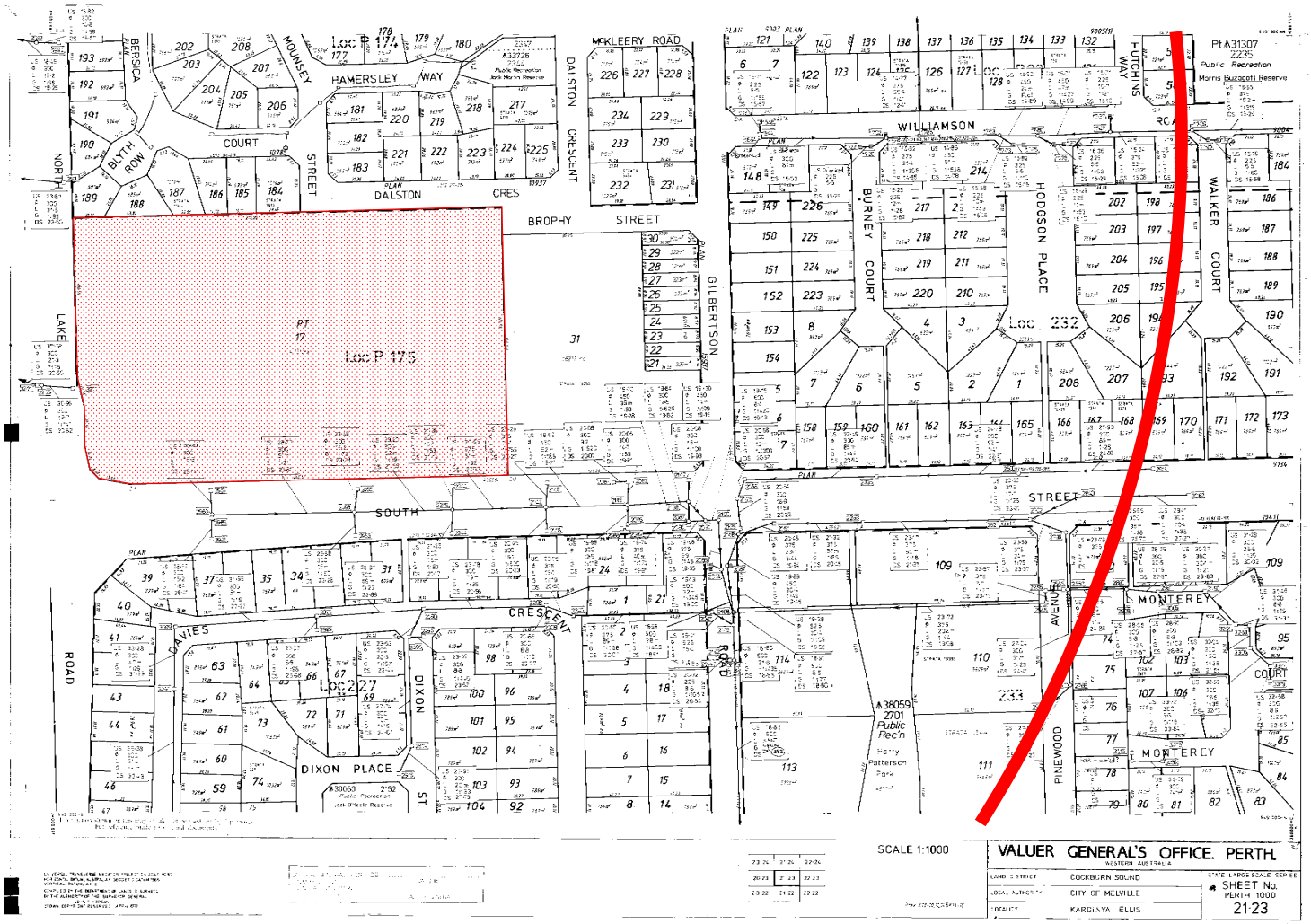
		DATE
SURVEYED	SURVEY RESULTS	10.09.2014
DESIGNED	T. SILVA / D. NGUYEN	27.10.2014
DRAWN	K. WILLIAMS	27.10.2014
CHECKED	D. NGUYEN	10.11.2014
AUTHORISED	T. NGUYEN	04.03.2015
RECOMMENDED	S. ALKINS	04.03.2015

SOUTH STREET (H032)
NORTH LAKE ROAD (3)

DRAINAGE MODIFICATIONS
SHEET 1 OF 2

LOCAL AUTHORITY (19H) CITY OF MELVILLE
COMMISSIONED

DRAWING NUMBER 201448-1859 -4 REV. A1



Appendix Eight: Stormwater Detention

Stormwater Drainage

Please find below general guidelines and conditions for on-site stormwater drainage.

Submitting Plans - Drainage Details Required

All building related plans submitted to the City of Melville, must include a site plan indicating the following drainage details:

- Existing ground levels or contours.
- Proposed levels of paved or concrete areas.
- Details of proposed roof and pavement drainage disposal systems.
- Size (depth & diameter) and locations of all soak-wells.

Factors such as soil conditions, water table depth and capacity for storm events need to be taken into account by the appointed professional engineer.

Conditions Applicable for all General Residential Developments

- All stormwater shall be retained and discharged on site.
- All soak-wells installed in paved or concrete areas shall be provided with trafficable lids and made accessible for maintenance purposes.
- Soak-wells to be no closer than 1.0m to a footing or boundary.
- All soak-wells used shall be from an accredited supplier.
- All soak-wells installed within flexible pavement areas (bitumen or brick paving) shall be provided with an appropriate base to prevent any subsidence of the well liners.
- It is the owner's responsibility to regularly clean and maintain on-site drainage systems to ensure its on-going functionality.
-

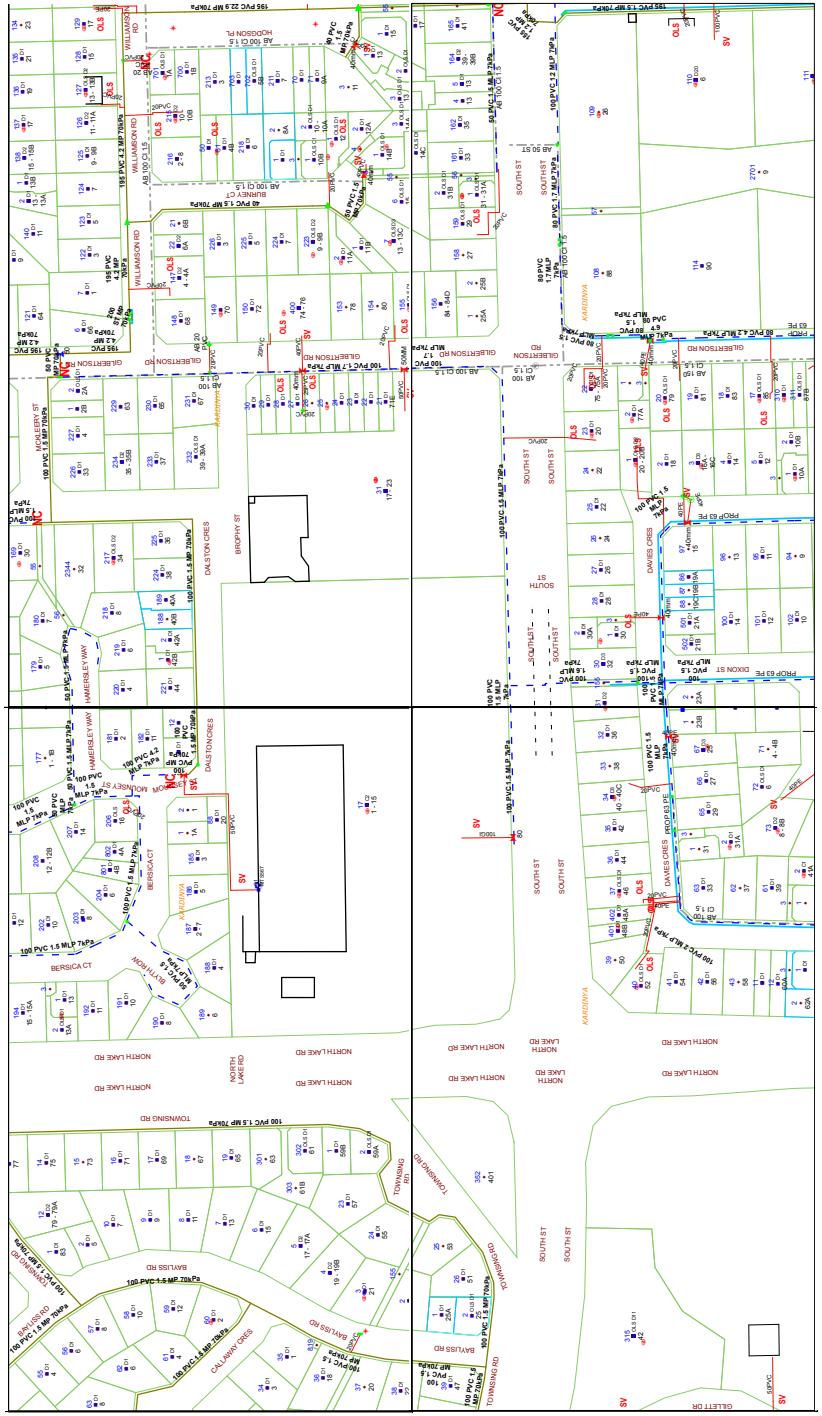
Residential sites located below road level shall have drainage systems designed to cater for a 1:100 ARI 24hr storm event.

- Residential sites located above road level shall have drainage systems designed to cater for a 1:20 ARI 1hr storm event.

Design Conditions Applicable to Industrial and Mixed Use developments

- All drainage systems designed for the proposed developments shall be certified by a Registered Professional Engineer.
- The design of the systems, shall conform to the requirements of the Building Code of Australia (BCA) and the Australian Standard (AS 3500).
- It shall be the Engineer's responsibility to demonstrate that a 1:100 ARI 24hr storm event is fully contained within the property boundary.

For further information, please contact the City of Melville Senior Design Engineer on 9364 0681.



Jamie De Palma

From: Asset Services <Asset.Services@atco.com>
Sent: Thursday, 12 March 2020 10:27 AM
To: Jamie De Palma; ATCO Gas AU – Land Development
Subject: RE: Kardinya - Corner South Street and North Lake Road - update to original feedback required thanks

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Kardinya

Hi Jamie,

Apologies for the late reply.

The gas distribution network in this area of interest in the suburb of Kardinya is currently going through a program to rationalise the gas pressure. Once completed (total completion by 2021) the gas network in this area will be able to supply a total of approximately 1900 dwellings.

Please do let me know if you have further questions.

Regards,

Mabel See
Asset Planning Engineer
Gas, Australia

E. mabel.see@atco.com
T. +61 8 6163 5042
A. 81 Prinsep Road, Jandakot WA 6164
W. atcogas.com.au

ATCO

From: Jamie De Palma <jamie.d@pfeng.com.au>
Sent: Monday, 9 March 2020 11:01 AM
To: ATCO Gas AU – Land Development <Land.Development@atco.com>
Cc: Asset Services <Asset.Services@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road - update to original feedback required thanks

Morning Asset Services,

Are you able to advise if the increase in dwelling count will impact the previous advice provided in December 2019?

Jamie De Palma
Associate - Civil

Pritchard Francis | T (08) 9382 5111

From: ATCO Gas AU – Land Development <Land.Development@atco.com>
Sent: Wednesday, 19 February 2020 10:17 AM
To: Jamie De Palma <jamie.d@pfeng.com.au>; ATCO Gas AU – Land Development <Land.Development@atco.com>
Cc: Asset Services <Asset.Services@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road - update to original feedback required thanks

Hi Asset services please can you assist client with his query thanks in advance

Regards

Lewis Searle
GIS Analyst
Gas, Australia

E. lewis.searle@atco.com
T. +61 8 6163 5160

From: Jamie De Palma <jamie.d@pfeng.com.au>
Sent: Wednesday, 19 February 2020 10:15 AM
To: ATCO Gas AU – Land Development <Land.Development@atco.com>
Cc: Asset Services <Asset.Services@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road

Morning Lewis,

The planning consultant for the Kardinya Structure Plan has received feedback from the WAPC and City of Melville, and the development area has slightly expanded with an expected yield of 1,856 dwellings in lieu of 1,521. An increase of 335 dwellings.

Will the additional dwellings impact your previous assessment for gas servicing?

Jamie De Palma
Associate - Civil
Pritchard Francis | T (08) 9382 5111

From: ATCO Gas AU – Land Development <Land.Development@atco.com>
Sent: Thursday, 2 January 2020 9:45 AM
To: Jamie De Palma <jamie.d@pfeng.com.au>
Cc: ATCO Gas AU – Land Development <Land.Development@atco.com>; Asset Services <Asset.Services@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road

Hi Jamie please find below ATCOs comments regarding your query

Thanks

Regards

Lewis Searle
GIS Analyst
Gas, Australia

E. lewis.searle@atco.com
T. +61 8 6163 5160

From: Asset Services <Asset.Services@atco.com>
Sent: Tuesday, 24 December 2019 11:41 AM
To: ATCO Gas AU – Land Development <Land.Development@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road

Hi Lewis,

Sorry for the late reply.

Currently, part of the distribution network in Kardinya is reticulated in MLP (MAOP 7kPa) pressure and this will be rationalised to MP (MAOP 70kPa) in 2020.
For 1521 domestic dwellings in the rezoned area around Kardinya Shopping Centre, the future MP network will be able to support this growth in medium pressure.

Please do let me know if you have any questions.

Regards,

Mabel See
Asset Planning Engineer
Gas, Australia

E. mabel.see@atco.com
T. +61 8 6163 5042
A. 81 Prinsep Road, Jandakot WA 6164
W. atcogas.com.au

From: ATCO Gas AU – Land Development <Land.Development@atco.com>
Sent: Thursday, 19 December 2019 12:32 PM
To: See, Mabel <Mabel.See@atco.com>; Asset Services <Asset.Services@atco.com>
Cc: ATCO Gas AU – Land Development <Land.Development@atco.com>
Subject: FW: Kardinya - Corner South Street and North Lake Road
Importance: High

Hi Mabel did you get a chance to have a look at this? client is chasing up…please can you let him know either way

Thanks very much

Regards

Lewis Searle
GIS Analyst
Gas, Australia

E. lewis.searle@atco.com
T. +61 8 6163 5160

From: Jamie De Palma <jamie.d@pfeng.com.au>
Sent: Wednesday, 18 December 2019 9:48 AM
To: ATCO Gas AU – Land Development <Land.Development@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road

Morning Lewis,

Hope things are going well at your end. Are you able to advise if the Kardinya structure plan amendment has been reviewed?

Jamie De Palma
Associate - Civil
Pritchard Francis | T (08) 9382 5111

From: Jamie De Palma
Sent: Wednesday, 27 November 2019 7:18 AM
To: ATCO Gas AU – Land Development <Land.Development@atco.com>
Subject: RE: Kardinya - Corner South Street and North Lake Road

Good morning Lewis,

Please find attached the proposed structure plan amendment depicting R-codes to achieve the desired 1,521 dwellings.

Jamie De Palma
Associate - Civil
Pritchard Francis | T (08) 9382 5111

From: Jamie De Palma
Sent: Tuesday, 26 November 2019 3:12 PM
To: ATCO Gas AU – Land Development <Land.Development@atco.com>
Subject: Kardinya - Corner South Street and North Lake Road

Good afternoon Lewis,

Pritchard Francis have been engaged to prepare an engineering services report for a potential structure plan rezoning of radius 400m around the existing Kardinya Park Shopping Centre.

A proposed structure plan with intended R-codes and number of dwellings is yet to be confirmed, although the client has suggested increasing the dwelling count by up to 1,500 within this 400m radius.

Can ATCO Gas please advise if any major upgrades to existing gas networks would be necessary to facilitate 1,500 additional dwellings?

I have also undertaken a dial before you dig search which has provided some data, but if ATCO Gas have a screen shot or similar which depicts this area in one image that would be super.

This is not a formal application for gas design, but rather a general request for network capacity.

If you have any queries, please call me.

Jamie De Palma
Associate - Civil
BE (Hons) MIEAust CPEng NER

T (08) 9382 5111
E jamie.d@pfeng.com.au | W www.pfeng.com.au
430 Roberts Road, Subiaco WA 6008 | PO Box 2150 Subiaco WA 6904

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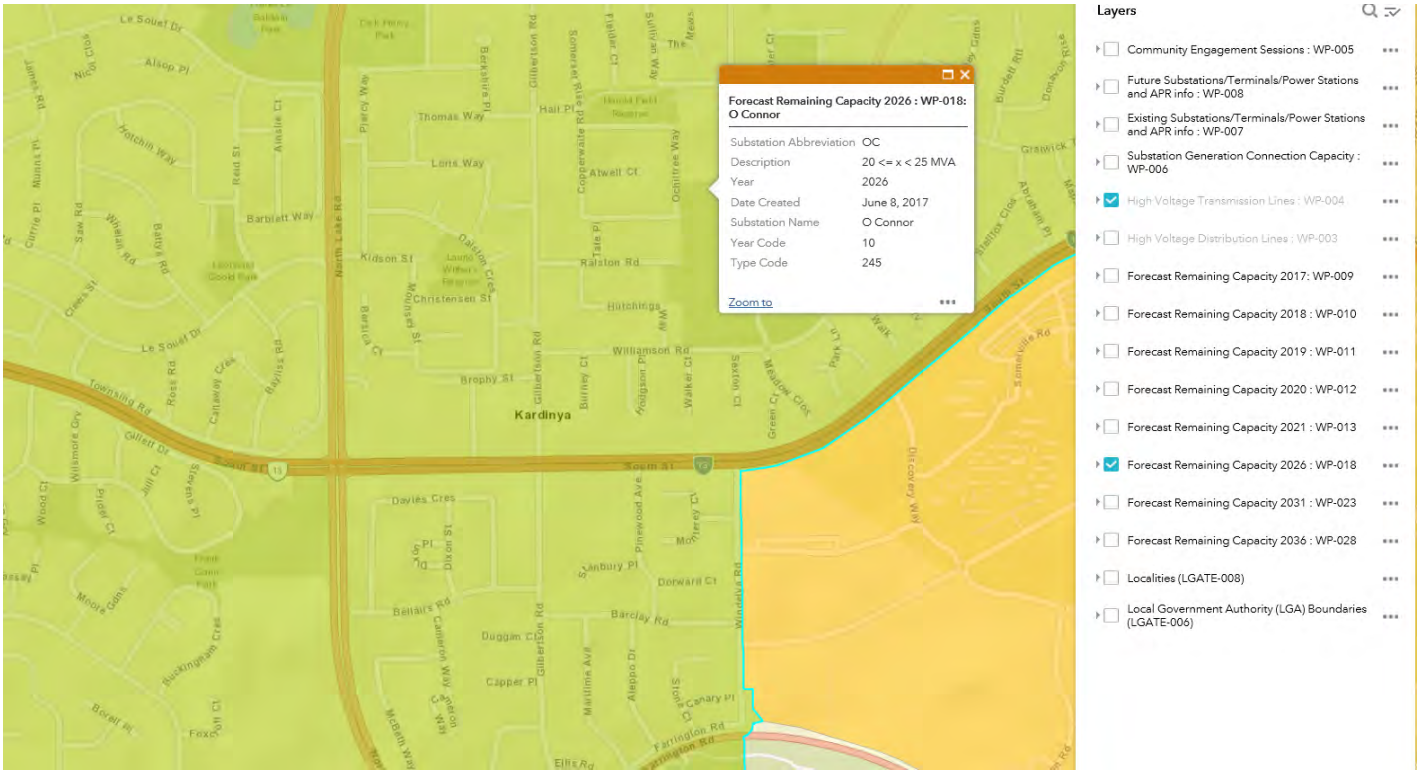
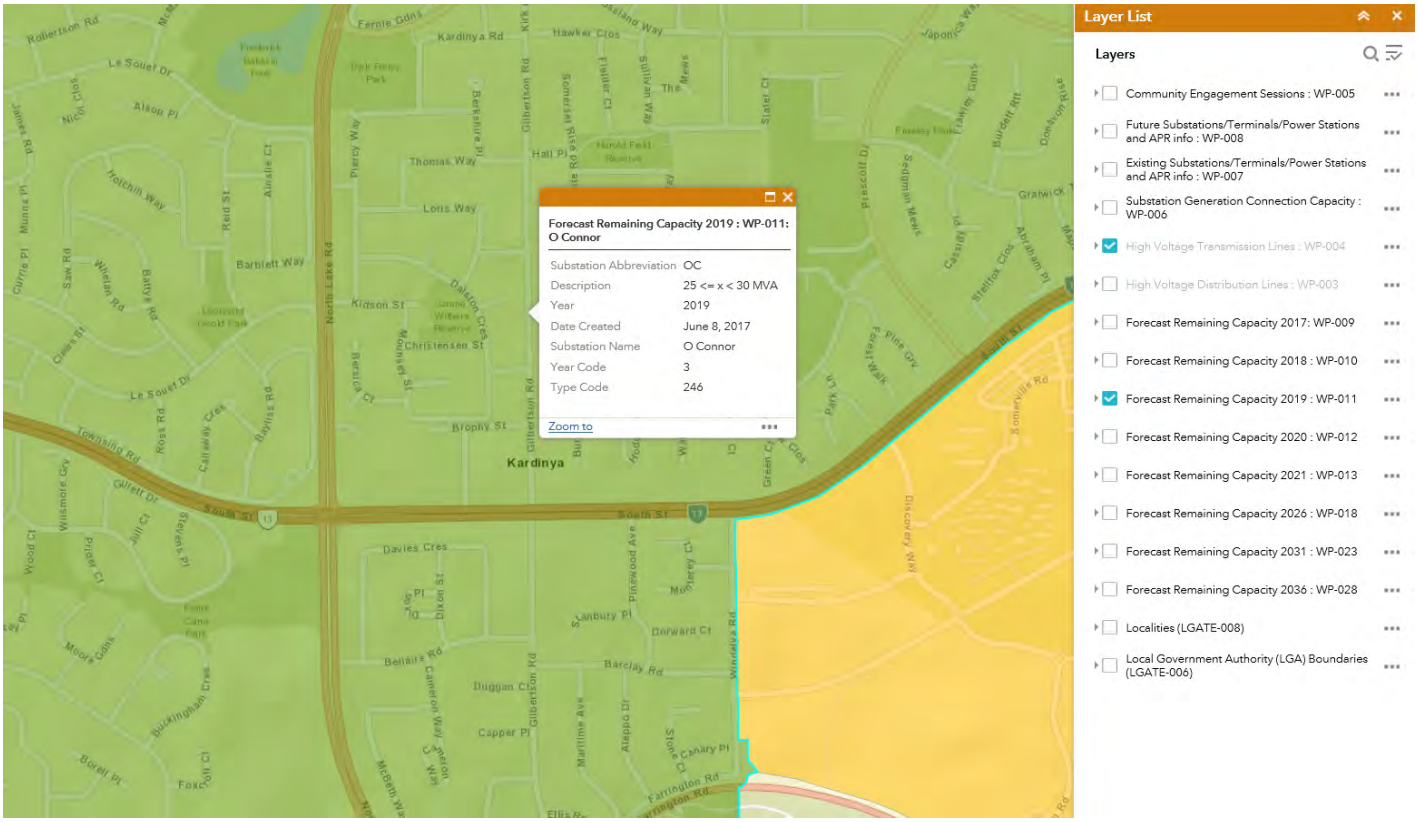
Appendix Ten: Electrical Infrastructure

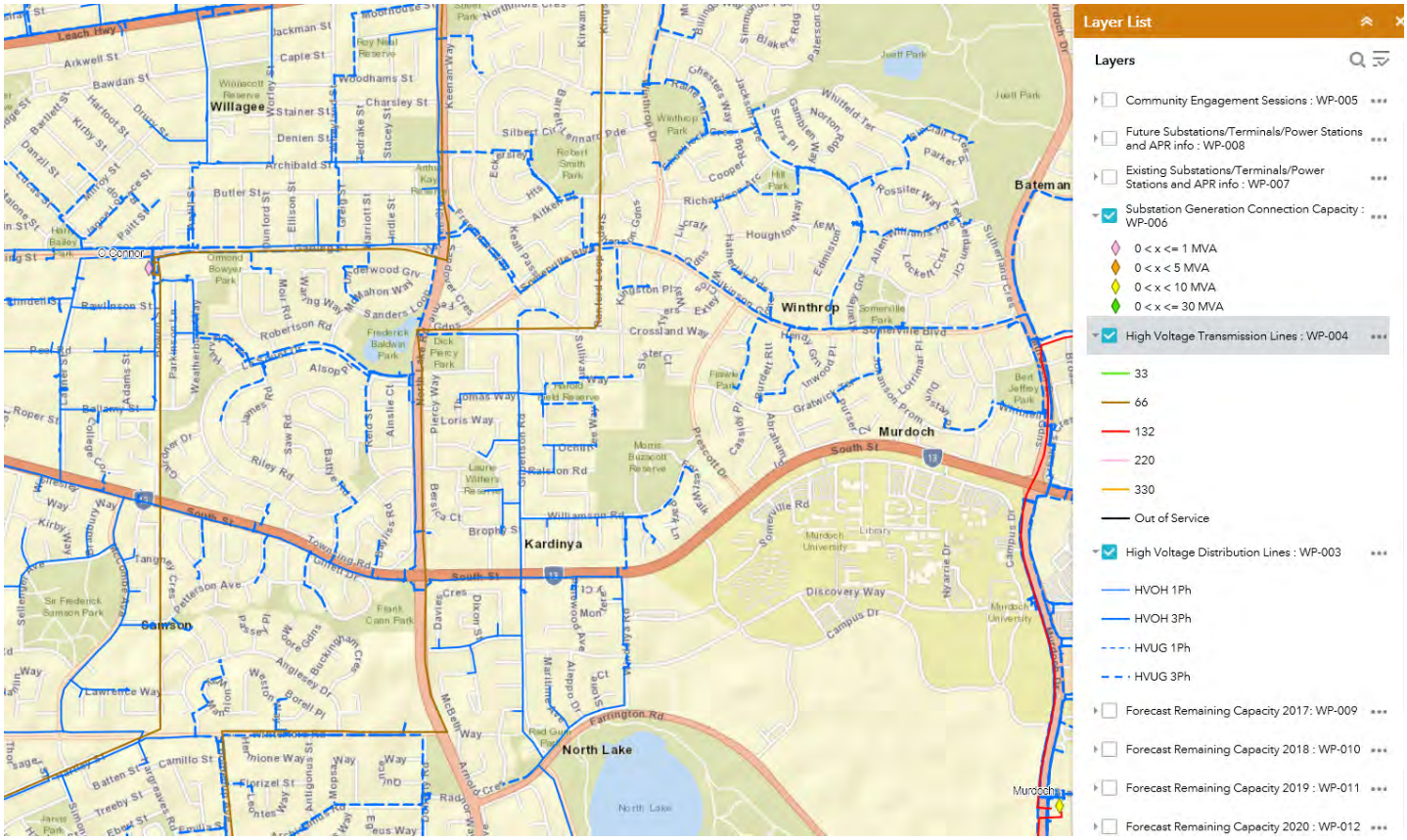
WESTERN POWER CAPACITY MAPPING 2026



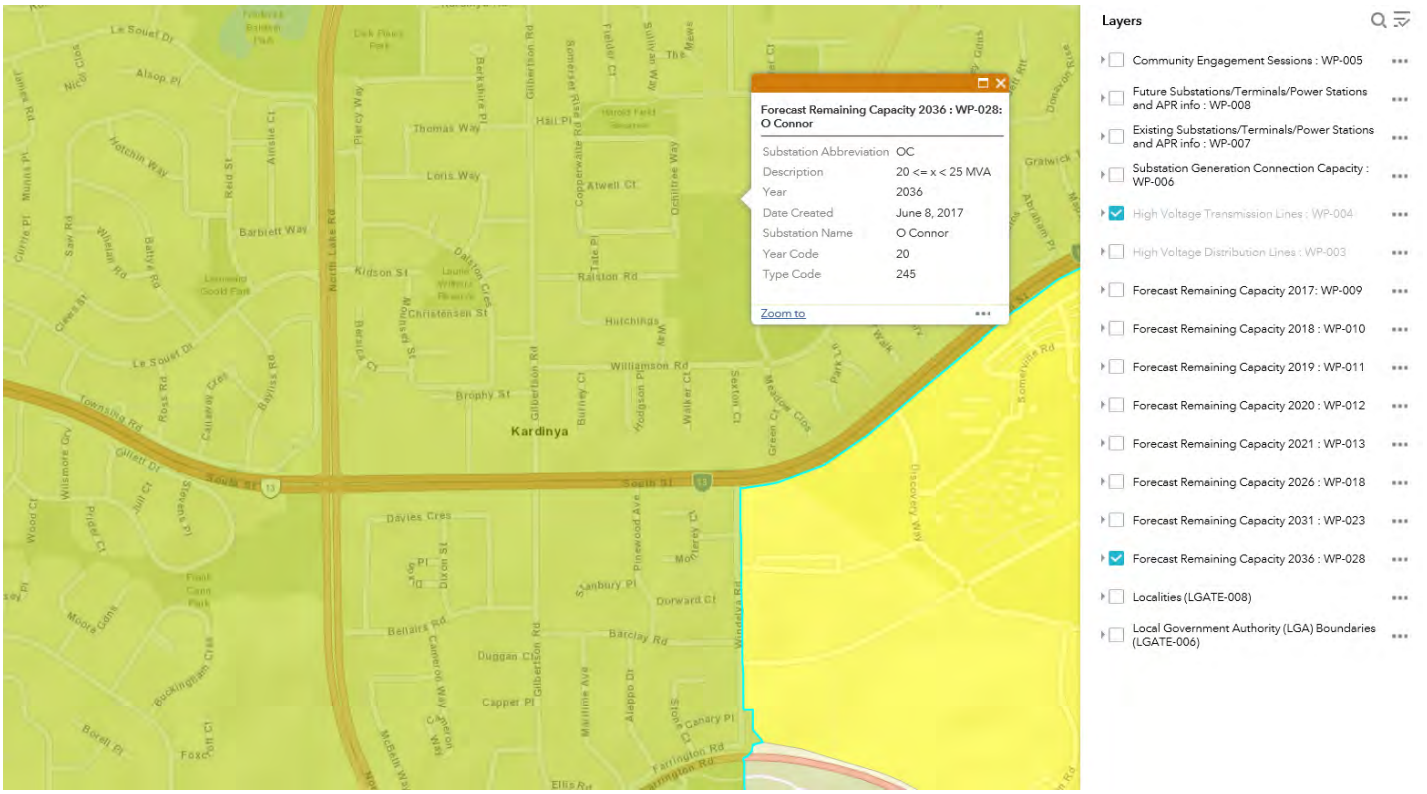
WESTERN POWER CAPACITY MAPPING 2019

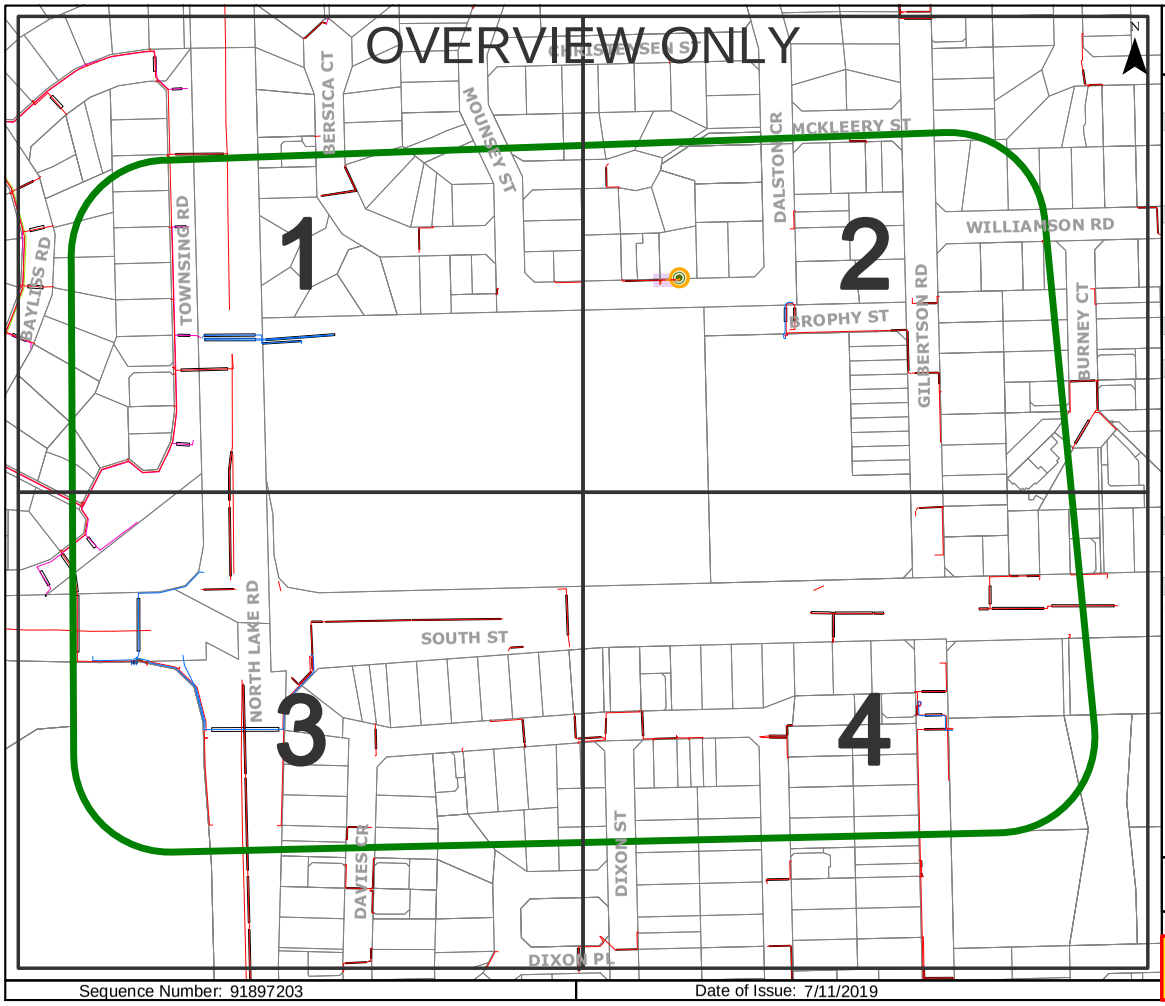


WESTERN POWER CAPACITY MAPPING
TRANSMISSION LINES



WESTERN POWER CAPACITY MAPPING
2036





Sequence Number: 91897203 | Date of Issue: 7/11/2019

westernpower

UNDERGROUND LEGEND

Structures

- Pillar
- Metal Pole
- Transformer Site
- UG Crossing *
- Ring Main Unit
- LV Distribution Frame

Distribution Cables

- High Voltage Cable (1kV - 33kV)
- Low Voltage Cable (< 1kV)
- Street Light Circuit (< 1kV)
- Street Light Pilot (< 1kV)
- Earth Wire

Cable Pole Terminations

- HV Termination
- LV Termination

Proposed Construction Assets

- Design Area *
- High Voltage Underground Cable
- Low Voltage Underground Cable
- Metal Pole
- Pillar
- HV Termination
- LV Termination
- Transformer site

State Underground Power Project

- CURRENT Work Area *
- COMPLETED Area *

Feature

- Area of Interest

*** Please refer to coversheet**

Privately owned cables NOT SHOWN (including house services)

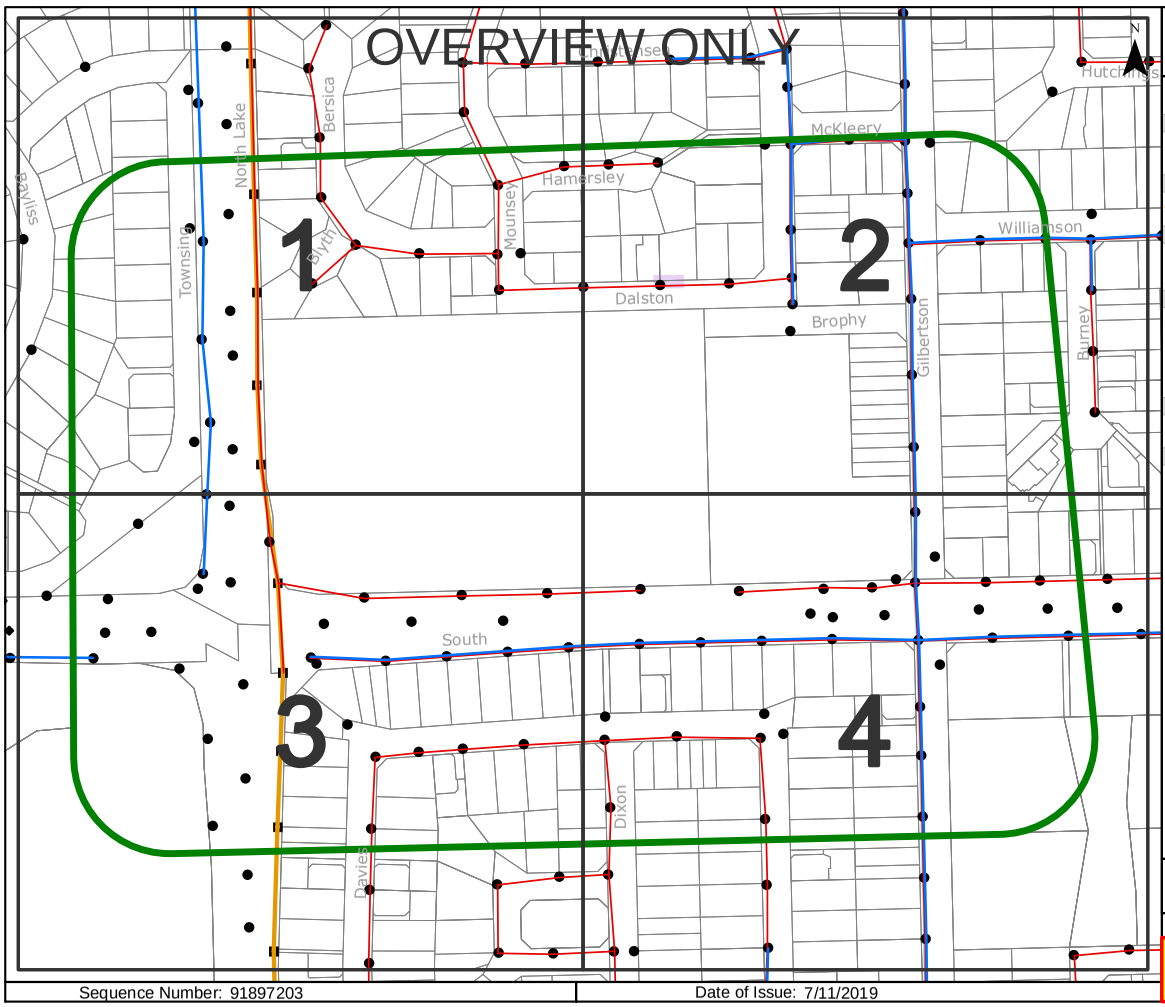
This map is INDICATIVE ONLY. Hand exposure via pothole method is MANDATORY.

Telephone Support: 1300 769 345
Mon to Fri - 08:00 to 16:30

Information valid for 30 days from date of issue

A4 | Scale : 1:3075

WARNING! Look out for overhead power lines



Sequence Number: 91897203 | Date of Issue: 7/11/2019

westernpower

OVERHEAD LEGEND

Structures

- Power Pole
- Transmission Poles

Transmission Overhead Powerline

- Transmission (33kV - 330kV)

Distribution Overhead Powerline

- High Voltage (1kV - 33kV)
- Low Voltage (< 1kV)

Proposed Construction Assets

- Design Area *
- High Voltage Overhead Powerline
- Low Voltage Overhead Powerline
- Power Pole

Communications Assets

- Overhead Pilot Cable

Feature

- Area of Interest

*** Please refer to coversheet**

Privately owned cables NOT SHOWN (including house services)

This map is INDICATIVE ONLY. Check that you have enough clearance from the DANGER ZONES near overhead powerlines.

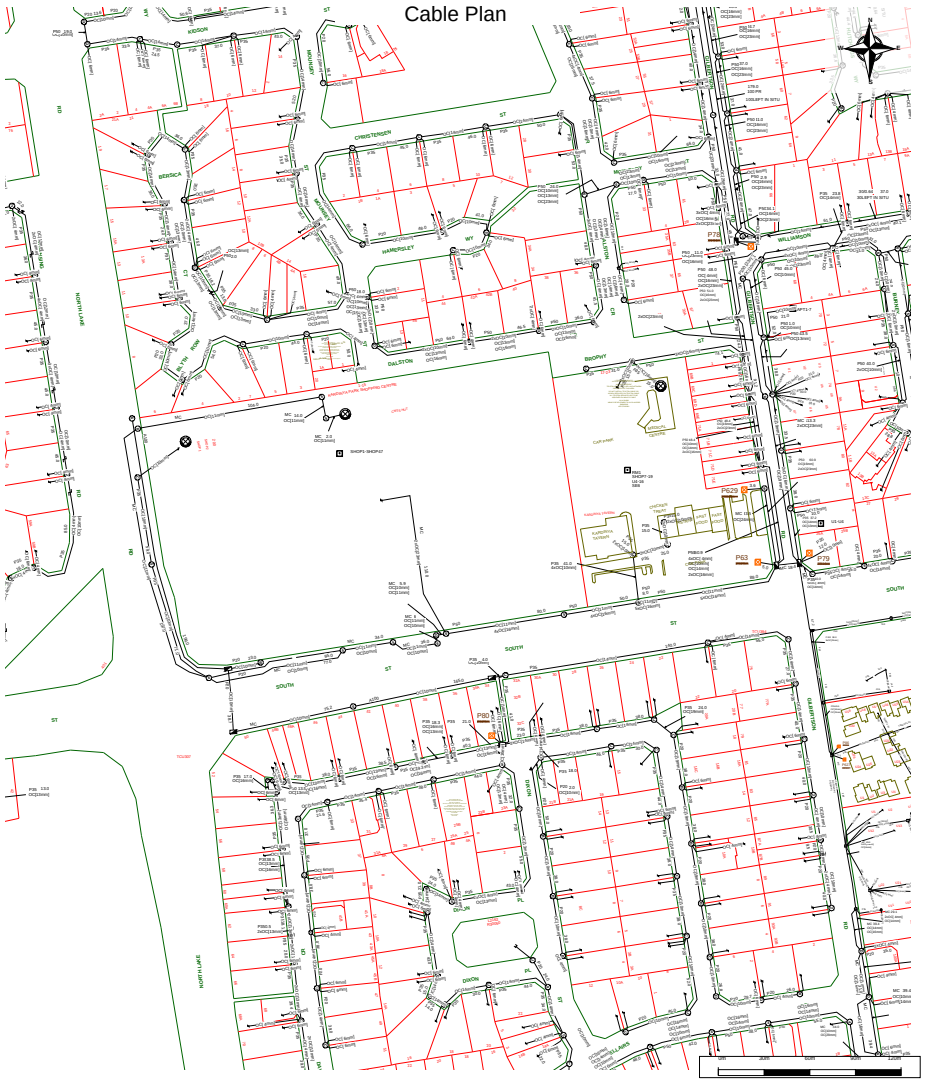
Telephone Support: 1300 769 345
Mon to Fri - 08:00 to 16:30

Information valid for 30 days from date of issue

A4 | Scale : 1:3075

WARNING! Look out for overhead power lines

Appendix Eleven: Communication Infrastructure



Telstra

For all Telstra DBYD plan enquiries -
email - Telstra.Plans@team.telstra.com
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 07/11/2019 15:10:39

Sequence Number: 91897204

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

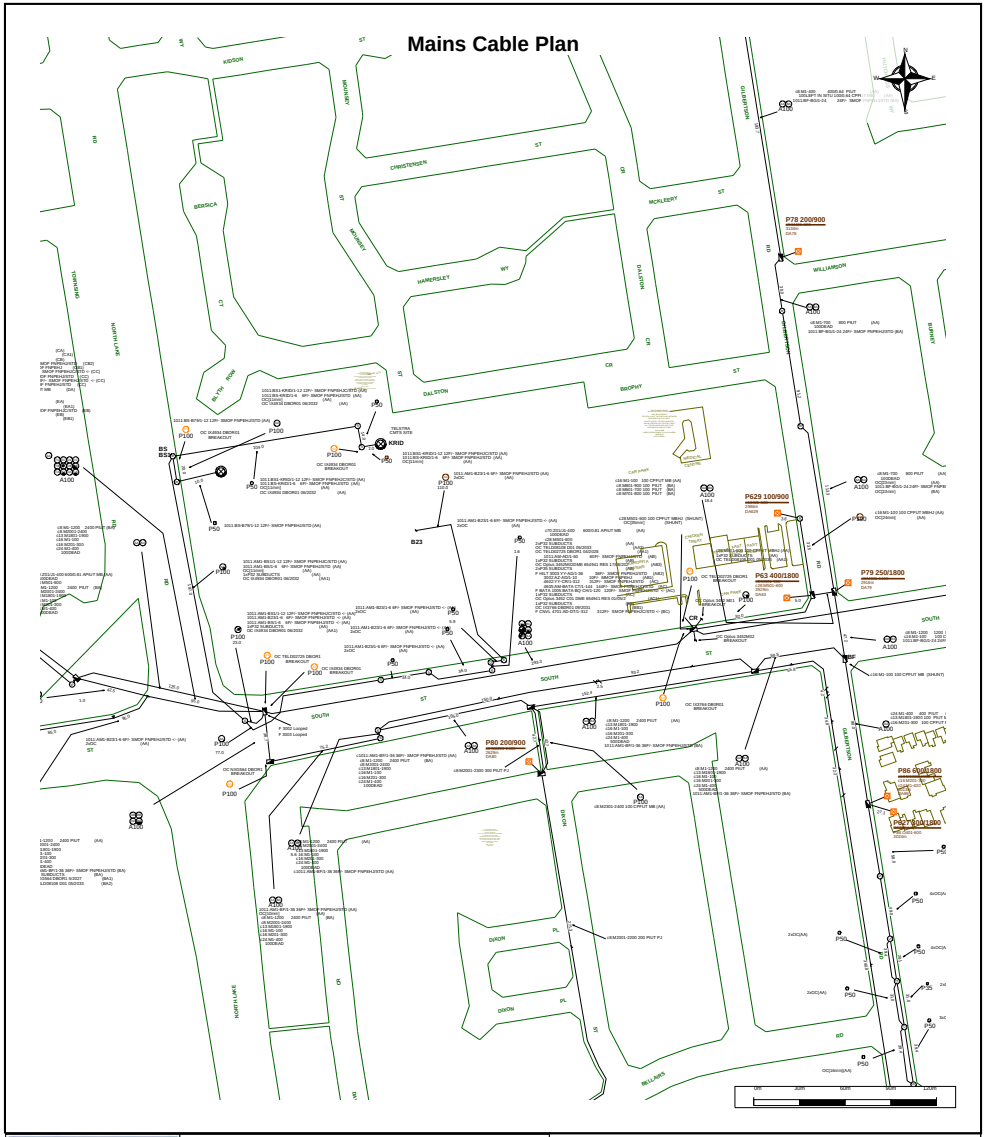
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Mains Cable Plan



For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 91897204
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.
Generated On 07/11/2019 15:10:42	

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

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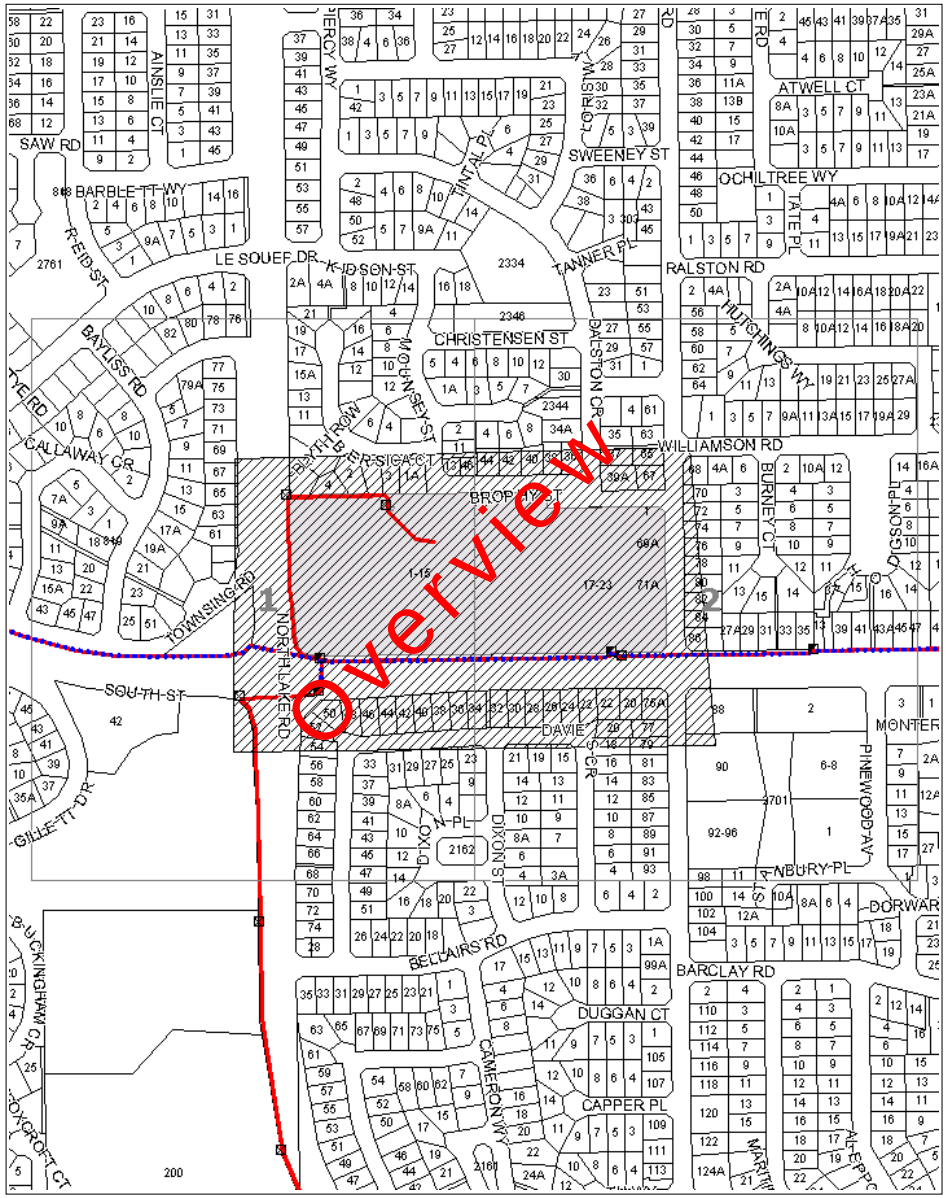
Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.



Sequence Number: 91897205 Date Generated: 07/11/2019

For all Optus DBYD plan enquiries –
Email: Fibre.Locations@optus.net.au
For urgent onsite assistance contact 1800 505 777
Optus Limited ACN 052 833 208

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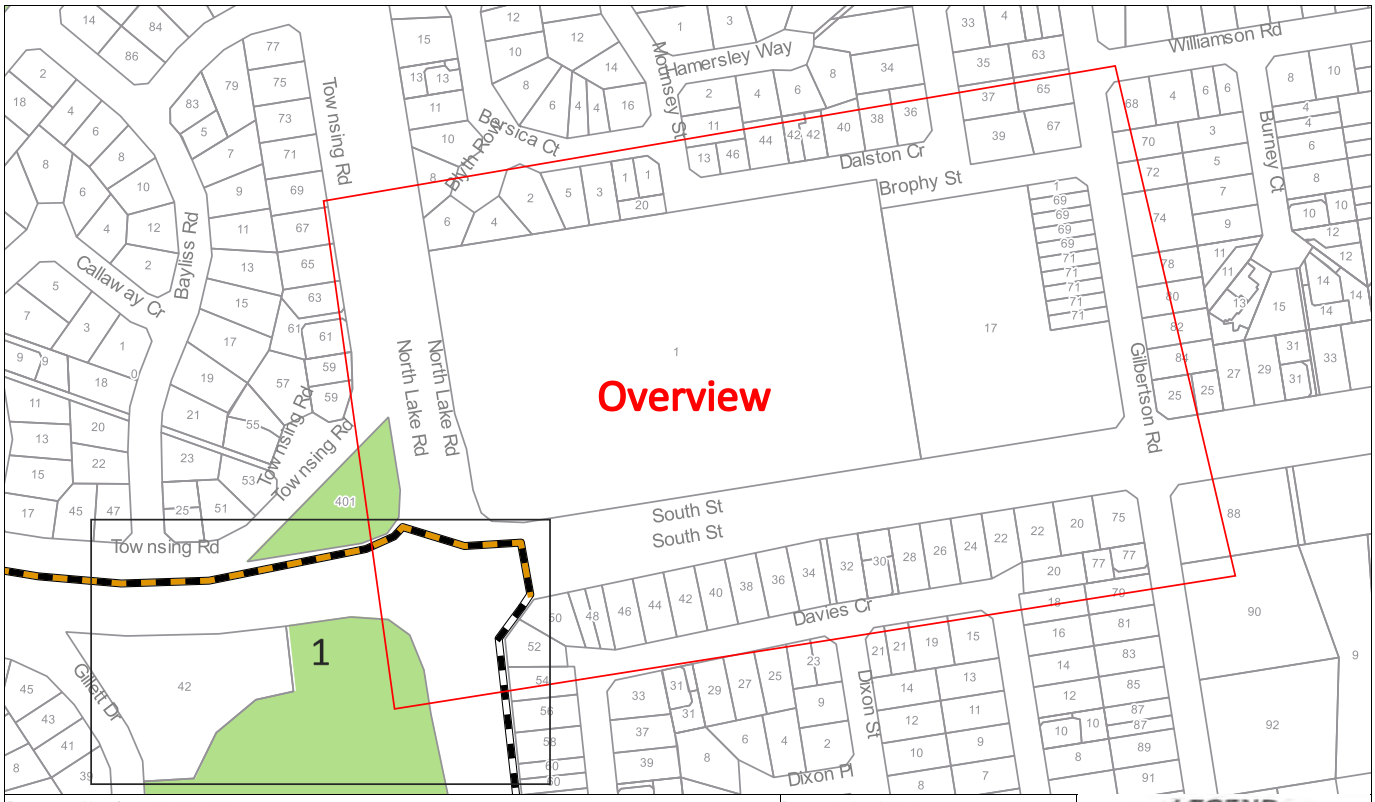

Sequence Number: 91897209

Date: 07/11/2019

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nextgen GROUP

LEGEND

Digsite
- Area

Assets
- Cable
- 3rd Party Duct
- Marker Post

element.

the art and science of place

Level 18, 191 St Georges Tce, Perth WA 6000
T. (08) 9289 8300 – **E.** hello@elementwa.com.au
elementwa.com.au